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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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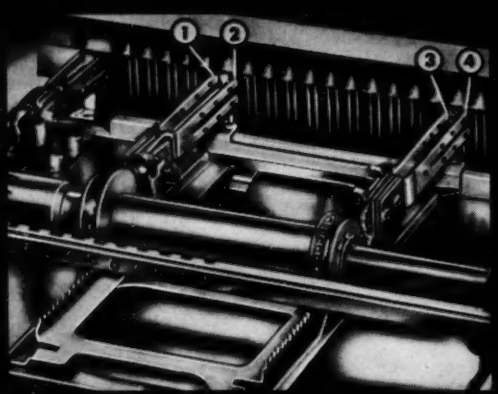

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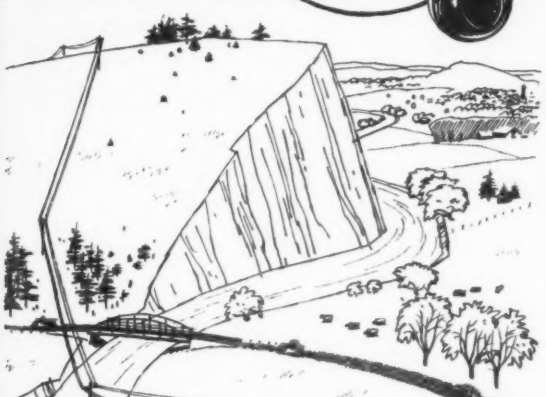

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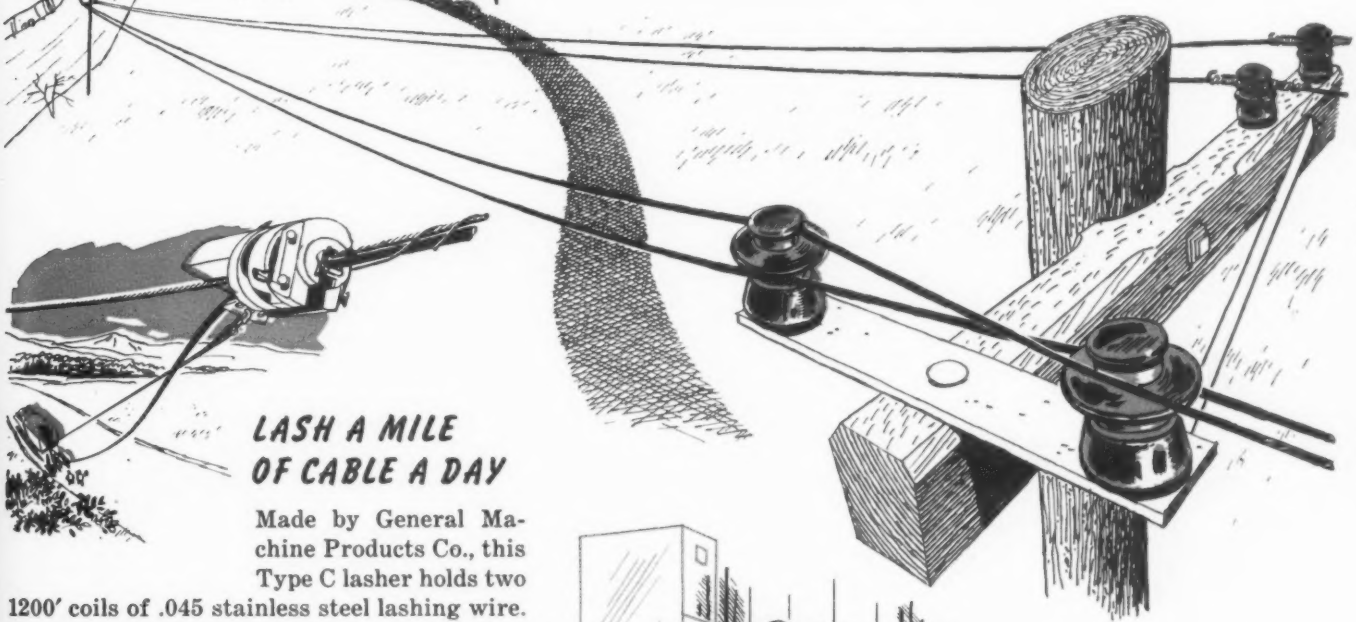

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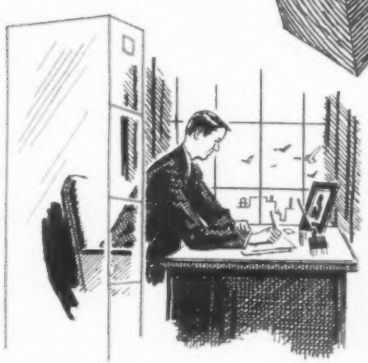

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• • •

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• • •

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Let's Look at the New Outlook for

Business-Goverment Relations

Address before convention of Ohio Independent Telephone Association in Columbus on April 20

By FRANCIS X. WELCH
Telephony's Washington Editor

WE ALL know that, as of Jan. 20, a great change came to Washington, D. C. But because it is such a change we may be led to expect too much by way of tax reduction or government economy. Incidentally, I hope that nothing I have to say will be taken too much in the partisan sense. We must speak, of course, of the first Republican administration in 20 years, because that is a fact—a reality. We likewise must speak of the anti-business overtones of preceding Democratic administrations. These are facts and realities. But underneath the surface, if we could just switch party labels, under a different set of historical circumstances, it would make surprisingly little difference from the standpoint of our practical blueprint.

The businessman who wonders what plans the new administration has in mind for business should really take an over-all look at the responsibilities which our government has at the world level, and again at the national level, before he can focus on his own local level.

To give you a better idea of this, I would like to take you on an imaginary trip right into the brain of President Eisenhower to look and see, with his eyes, the problems which now confront his new administration. We might call it a sort of "Ike's Eye View" of the universe.

It was wise old Aristotle who said —three centuries before Christ—that each man carries around, within himself, a little world, a microcosm. What he meant, of course, was that our problems—as individuals, whether we are businessmen, farmers, workers, or heads of families—are not much different, except in degree and scope, from the problems and responsibilities which face the rulers of a nation, as well as the nations of the world.

We all recall that the New Deal brought a lot of reforms, including business reforms. And many of us will agree that these reforms were long overdue. But, in the process, a good deal of class conflict was stirred up in order to develop a political support for these reforms. The succession of Roosevelt victories at the polls tended to put a political premium on such class conflict. We began to witness a fairly cynical attitude on the part of some politicians who thought they had devised an unbeatable formula for success at the polls. We have heard it called the "Hopkins Formula"—the formula of "Tax-Spend-Elect"—a sort of legalized Robin Hood policy for taxing very heavily the relative few who have, to pay for benefits for the much more numerous class who have not, so that they will continue to vote for the administration in office. This was, in a way, simply the old technique of bread and circuses of the Roman Caesars.

But there were a good many thoughtful observers who, up to last November, felt that nothing short of a collapse of our national credit would stop this politically inspired trend toward redistribution of wealth, and the deliberate cultivation of class hatred. A good many of us were convinced that nothing could ever defeat Santa Claus, except an empty bag.

At any event, for those concerned about national unity of democracy, the recent election result was a good start. But it is only a start. We do not know how long it will last. It is up to Ike to make the most of it and even broaden, if possible, the very narrow majority his party has in Congress. Businessmen, therefore, must look on the Washington scene with the realization that the new administration cannot go too far or too fast in the direction of tax reduction and government economy until certain other things are done which have to be done.

Now as business people, all of you have a special interest in the success of our Federal government's conflict with and protection against what we call the Iron Curtain countries because it is fundamentally an ideological conflict, an issue between communism and your own enterprise system. Why does this conflict exist? Because it is a basic tenet of communism, laid down by Marx, Lenin, and the other founders, that communism cannot exist indefinitely in the same world with capitalistic nations. No matter how many so-called peace overtures or gestures leaders, such as Malenkov, may make from time to time, they all believe very dogmatically in the inevitability of a capitalistic collapse.

It certainly seems ironic that Marxist philosophy, which denies the existence of God or of any planned order

in the universe, should insist on the economic infallibility of its belief that the whole world must eventually come to embrace and live under the communist system. That is what is called economic determinism. And like almost every other major prophecy which Marx ever made, it is being proved wrong by history.

Aside from the tense military situation, President Eisenhower must give thought to international, economical, and cultural problems, such as overpopulated or backward nations, or places where racial tensions are acute. These problems are all just as difficult to solve as the active military problem. There are no easy answers and no answers upon which there can even be very much agreement, even if they could be carried out. Also, in this list of things Eisenhower must worry about is one very important consideration for any President—the voters' interest. If Ike fails to keep the voters happy, his administration might face a hostile Congress elected in 1954, and it could be voted out of office in 1956.

Moving over to the domestic scene, I think it fair to say that last fall the majority of the people in this country condemned the drift toward centralization—toward a system of superstate control in Washington. Eisenhower spoke up in concrete terms during the campaign, and pledged that he would stop the drift toward centralized absolutism. Since then, his stand on the tidelands oil and gas question, and statements of Interior Secretary McKay, reverse a trend. Without going into detail, I might add that the future of the public utility industries as private enterprise may well depend, in the long run, upon this protection of local government and local regulation.

Speaking about local regulation tempts me to digress for several minutes from any discussion of strictly federal-business relations, to consider a problem which I believe might be of particular interest to you good Ohio telephone people. I refer to several bills which were introduced in your state legislature to amend the reproduction cost rate base requirement of your present rate-fixing practice and require some consideration of original cost rate base, and otherwise impose new accounting and reporting requirements on your Ohio telephone companies.

I know that others on this program are going to deal with this and other close-to-home problems of the Ohio telephone industry. But I would like to take this opportunity to say a few words on the importance of maintaining the integrity of your public utility regulation in Ohio, because this situation is a good example of how government and business (in this case the regulated utility business) must work together to bring about prosperous and efficient service to the public.

I am well aware of the fact that a compulsory original cost rate base is nothing new in this country and that it is practiced not only by our federal regulatory commissions, but also by a fair majority of the state commissions. At the same time, we have witnessed, within the last few months, three state commissions being directed by their respective state supreme courts (Illinois, Maine, and Maryland) to give recognition to reproduction cost. It would be strange indeed if Ohio, which has stood so firm, and at one time stood almost alone in recognizing reproduction cost, should choose this particular time, in the face of a counter-trend, to desert the common sense standard of current value.

Clearly, it is the result of prolonged inflation which has made these courts in other states think about the impracticability of tying such important industries, as the public utility services, to a rigid cost basis. We all know that the purchasing power of the dollar has been cut in half within the last decade. Do we have to wait for runaway inflation, such as ruined the German mark and virtually wrecked the French franc and Italian lira, before admitting that blind adherence to a cost basis is just not a common sense standard in an inflationary era? If we do, we will see the end of free enterprise in the utility business .

Just to give you an example of an extreme case, at the American Bar Association convention in San Francisco last year an attorney (George Jackson Eder) connected with the former owners of the Shanghai Telephone Co. before it fell into the hands of the Chinese communists, discussed this point. He recalled how the money was depreciating so rapidly it had to be put into wooden crates alongside the paystations. It had to be picked up twice a day and deposited in the banks before it could depreciate further. He mentioned the fact that the original cost rate base of that company's entire property, stated in terms of debased Chinese dollars, could not buy a single telephone.

Now admittedly that is an extreme case. But to what limit does inflation have to go before we are willing to concede that strict adherence to a cost basis can be unjust and impracticable? Is it 50 per cent? Is it 75 per cent? I, for one, have always preferred some recognition of the common sense standard which we find in Ohio law, requiring the regulatory commissions to give heed to the economic facts of life, as of the time they are fixing rates. Granted, there may be periods of rela-

REA Approves Two Loans Totaling $281,000

The Rural Electrification Administration approved two telephone loans during the week of Apr. 6 to 10. Details of the two loans follow:

Florence (Miss.) Telephone Co., $87,000, second loan to this borrower. Approved on Apr. 8.

These loan funds will be used to increase the basic plant capacity beyond earlier plans to handle expected growth in the area, for additional trunking facilities, and for facilities to handle an increase in the proportion of graded service.

In addition, the loan will cover increased construction costs involved since the first loan of $129,000 was approved in November, 1951.

The rehabilitation and construction possible under both REA loans will enable the borrower to bring new and improved telephone service to 503 rural subscribers in Rankin County. The completed system will consist of 89 miles of line.

* * *

Albany (Minn.) Mutual Telephone Association, $194,000, second loan to this borrower. Approved on Apr. 9.

These loan funds will be used for the construction of 48 miles of line and other facilities to furnish modern telephone service to 127 subscribers not provided for in the first loan. In addition, it will cover increased construction costs involved since the original loan of $363,000 was approved in October, 1951.

The expansion and rehabilitation possible under both REA loans will bring modern telephone service to 1,195 rural subscribers in Stearns County. Automatic central offices will be located at Albany, Freeport and New Munich. The borrower is planning service without toll charges among the three exchange areas. The completed system will consist of 322 miles of line.

tively stable prices when the original cost formula can give us a quick and easy answer to the rate base, while at the same time doing a fair job of rough justice. But there are other times, and I think we are passing through them right now, when it just won't work.

There are those, remembering the depression of the 1930's, who warn that prices will not always be up, and conceivably may go down. That is quite true with respect to the short-range inflationary spurts. But the public utility business in this country is old enough to demonstrate the fact, well known to economists over the centuries, that the long-range value of property with relation to money is upward. Or to put it the other way, the historical trend of any monetary unit is a decline in purchasing power. This means that strict adherence to original cost in the fixing of rates is nothing more or less than a system for shortchanging the investor.

Herbert Weatherspoon, vice president and general counsel of the Carolina Power & Light Co., put it very well in testifying a few weeks ago on the same kind of a bill before the North Carolina Legislature when he said: "Original cost is nothing more than bare bones. And when such cost is depreciated, it's bare bone scraped . . . It's a system valued as though it had no business, no customers . . . It makes the whole procedure rest on the cost of money."

This phenomenon of increasing property value was known even in the time of the Emperor Justinian the Great, under whose authority the great code of Roman law was compiled. The emperor himself reflected on the difference between the much greater land value situated within the Roman Empire as compared with similar land in Asia Minor and Africa. The land was about the same quality, grew the same amount and quality of crops, had the same rainfall. But the Roman farmer had the benefit of a business system, transportation, access to markets, and the security of a lawful system of property rights. Consider the value today of the great Alaska territory which was purchased from Russia in 1867 for $7,000,000. Or the great Louisiana Purchase at an original cost of $15,000,000 paid to Napoleon Bonaparte early in the last century.

The great expounder of the British common law, Lord Coke (1552-1634), recognized this common sense principle that, over the long run, a given piece of property is going to become of more value even though particular structures may depreciate and have to be replaced. This was stated in the Latin maxim, *Ultres magis valeat quam pereat*, 13 Rep 21, 2 Rep 30a 296. "Increasing value is greater than that which disappears with time."

ANCHER NELSEN, newly appointed REA administrator, succeeding Claude R. Wickard. He was nominated for the post by President Eisenhower on Mar. 31, and the nomination was confirmed by the Senate on Apr. 10. At the time of his appointment he was lieutenant governor of Minnesota (TELEPHONY, Apr. 18, p. 13; Apr. 11, p. 45; Apr. 4, pp. 9 and 11; Mar. 28, p. 17, and Mar. 21, p. 9).

And if all this sounds like obscure and ancient history, I would like to tell you an amusing little story to demonstrate how prone all of us are to attaching false significance to statistics, whether they be dollars or measurements. The story goes that a successful middle-aged businessman became painfully aware of some distressing symptoms concerning his health. He suddenly developed bulging eyes and buzzing in his ears. His family noticed it too. He went to a doctor who took a grave view and after careful clinical tests recommended a very delicate brain operation to relieve apparent pressure inside the cranium. Three months (and about $5,000) later he went back to work feeling much better. But within a week the same symptoms occurred—bulging eyes and buzzing in his ears. He returned to the doctor; and this time the verdict was even more discouraging. He was told that medical science had done what it could. But apparently there was some sort of a growth which would probably mean the end of his life within six months.

Well, this was quite a shock! Yet, the businessman decided to make the best of what time he had left. He decided to take a trip and see some of the places he had always wanted to see. So he drew some money out of the bank, and got measured for a couple of new suits of clothes. Among other things, he went to his favorite haberdashery to order a half-dozen shirts. Now, there was a new clerk on the shirt counter, and when the customer told the clerk he wanted size 14 neckband, this clerk objected. But the customer insisted that he had for years bought shirts at that counter with size 14 neckband. The clerk was not convinced. He told the businessman: "You can do as you please, but I will tell you what will happen to you if you persist in wearing shirts with a size 14 neckband. You will get bulging eyes and buzzing in your ears."

And that is the type of standard some of our strict original cost regulators are seeking to impose on a fast-growing utility industry. They are trying to make the industry wear the same size 14 financial neckband. And if they keep it up, they are going to strangle the utility business!

Don't get me wrong about commission regulation. I yield to no one in my respect and confidence for our great system of regulatory justice. It is a technique which is peculiarly American, and of which we can be proud. It has been developed through the years by trial and error methods, court guidance, and investor confidence. It is quite unlike the development in public utility operations in other countries throughout the world — with the possible exception of the Dominion of Canada. Comparing utility regulation in this country and abroad, the impartial student of regulation is struck first of all by the fact that nowhere else in the world today are the public utility services so much under the control and operation of private ownership as in the United States.

It is a fair question whether regulation of public utilities, as it developed in other countries, did not have at least a contributory effect on bringing about the much greater amount of public ownership we see in those foreign countries. Conversely, this might well indicate that regulation of public utilities as it has developed in the United States might have played its part in keeping our people satisfied with a continuation of public service under a system of private enterprise, but subject to regulatory control by the government.

It is precisely because I *do* value the principles of fair play and justice, which have led to our development of commission regulation as a great bulwark against socialization of our public utilities in the United States, that I fear the danger of distortion or debasement of that great system. It is a system which has given us the best operated and patronized public utility service in the whole world, with the

(Please turn to page 66)

Outdoor Paystations Pay Off

Article in company's magazine—"The Mouthpiece"—led to a request for this article telling of the revenue gained from outdoor stations

By CHARLES H. HESS, General Commercial Operations Assistant
General Telephone Co. of Pennsylvania

OUTDOOR paystations have a place in the operations of every telephone company. They fill a need that cannot be satisfied by any other type of telephone service. The value of outdoor paystations seems best emphasized by what they offer. For examples: (1) Twenty-four hour a day service to the public-at-large; (2) additional revenue; (3) convenient service; (4) a good rate of return on a reasonable investment; (5) advertising medium; (6) that "extra something" that always means so much to good public relations.

General Telephone Co. of Pennsylvania installed its first outdoor public paystation in 1950. It was an experimental installation that was made in one of the smaller exchanges of the company to permit close study of the varied aspects of this type of service. Results of the experiment were quite satisfactory and since that time, a program for the development of outdoor paystations has been in progress.

The program is not complex. But it does entail a nominal amount of advance planning and research. First, the exchange area should be explored to determine what capacity exists for outdoor paystations. Second, tentative locations should be selected, and third, local ordinances should be thoroughly checked. Where state regulations might be involved, these also should be reviewed.

Good locations are essential, and somewhat more than superficial consideration ought to be given to their selection. Even the exact position of the booth should be decided once the general location has been agreed upon. Merely a matter of several feet in one direction or another, or the direction in which the booth is faced can cause a substantial difference in the revenue obtained. It is also important that every location should provide sufficient natural protection to discouarge vandalism. Avoid poorly lighted streets and isolated areas.

Among the better spots for outdoor paystations are arterial highways, summer resort areas, downtown shopping centers, and fringe area shopping centers. These locations lend themselves to permanent installations of outdoor paystations.

There are other instances where temporary installations can be made. At stadiums during the football season, at county fairs, in areas where regular telephone service is not immediately available because of a shortage of central office or outside plant facilities. Naturally, temporary installations generally are not as renumerative as permanent ones. However, the cardinal responsibility of all telephone companies is public service. Temporary installations can be a measurement of to what extent a company is public service minded.

At times local ordinances and zoning regulations can have a definite influence on the establishment of outdoor paystations. There are communities that place this type of service in the business category and will not permit installation in a residential zone. Installations

During 1952, the average monthly revenue from this outdoor paystation was $77.05. It is located in front of the telephone company's business office. The exchange has 2,477 stations. This installation is discussed in Case Number 5 in the article. Further details are presented on page 78 of this issue.

along highways should not be made without determining whether or not there are state requirements that must be fulfilled.

Sometimes it is possible to get blanket permission from the city authorities or town council to proceed with the installation of outdoor paystations. More often, each installation must be individually cleared. Regardless of how it is accomplished, the telephone company will be wise always to obtain proper permission before proceeding. It costs money to complete an installation and it is money "down the drain" if the paystation must be removed. Such occurrences are not only costly but they can bring down criticism on the telephone company.

One other factor that needs attention, relative to installations where most of the revenue will depend upon vehicular traffic, is parking space. Choose locations that have ample room for parking in the immediate vicinity. Where revenue will depend primarily on pedestrian traffic, parking facilities, although helpful, are not essential.

The actual installation of outdoor booths requires few special arrangements. For permanent installations, it has been our practice to provide concrete bases to which the booths are securely fastened. Temporary installations do not receive this attention. Care is always taken to mount booths so that any water that may find its way into the booths will drain off.

Night lighting for all booths is a requisite. This can be best accomplished by connecting the light fixture to a phototube operated mechanism (such as the Ripley Light Watchman), which automatically turns the telephone booth light on at dusk and off in the daylight. It will also illuminate the booths should semi-darkness occur during the daytime hours.

Paystation signs should not be forgotten. Illuminated signs mounted on the booths will make the booths conspicuous at night—a desirable feature. Along highways, approach signs can be used to excellent advantage. Approach signs should be a reflector type so that they can be seen plainly at night. Signs serve a twofold purpose. They add to public convenience and increase paystation usage.

Usually, one of the big questions regarding outdoor paystations is losses from vandalism, robbery, etc. While it was first thought that such incidents would be a matter of concern, experience has disproved it. As yet no major losses, which were more or less expected with this type of service, have been realized. There has been occasional breakage of window panes and

(Please turn to page 76)

This booth is near the outer limits of the city, along an arterial highway. The average monthly revenue during 1952 was $50.85. The sign on top makes the booth conspicuous even at night.

ABOVE: This outdoor paystation is located within a state park recreational area to serve summer visitors. BELOW: A fringe area shopping center is a good location to produce revenues.

ABC of the Telephone

By FRANK E. LEE

AS DISCUSSED in recent articles in this series, the general log is the primary record of the central office maintenance program. All of the trouble reports handled by the plant repair department should be recorded on the log. In larger central office areas it is apparent that the volume of reports handled will be greater than in a small exchange area. However, on a comparative basis, a record of maintenance results is as important in one as in the other.

Another factor of equal importance in either the large or small office is the need for maintaining a general log that will provide the necessary information at the lowest possible cost. A worthwhile saving can be made by effective layout and design of the general log sheet. The general log sheet illustrated in *Fig. 1* was planned with this thought in mind.

This log sheet, while simple in design, facilitates the recording, closing, and summarizing of reports received at the repair center. A significant departure from conventional procedures is the inclusion of a code summary column on each log sheet. The use of this feature makes it possible to balance each sheet individually. As a result, this general log sheet has advantages for any size central office.

In the small office it is assumed that a single log sheet will be sufficient for from five to seven days' business. Thus, a self-contained log and summary reduces paper work to a bare minimum in this type of office. Important, also, is the fact that with a minimum amount of clerical expense an effective trouble analysis summary is made available.

The next application of this type of log sheet is in the central office area where more than one log sheet is required to record the trouble reports received in any given day. Here, again, the individual log sheets will save clerical expense in making daily summaries.

It will be noted that this log sheet is uniformly punched along the upper margin with holes 7/32 inch in diameter and spaced the width of the code summary column. With this feature the log sheet can be used with any of the Summary Board Strip plans of Accounting. A strip plan of accounting is a speedy, accurate method of cross-adding figures from a series of report sheets.

PART 63. CENTRAL OFFICE MAINTENANCE—ANALYSIS OF GENERAL LOG. The preceding article in the series appeared in the Mar. 14 issue, p. 17.

The basic principle of strip plan accounting is the overlapping or "shingling" of forms on convenient summary boards or on strip peg bars. *Fig. 2* illustrates how a group of general log sheets are held in place on the steel pegs and arches of a summary board. The figures in each code classification are held in a horizontal position so they may be readily cross added by calculator or adding machine.

To set up the general log sheets for summarization by the strip plan of accounting, a blank copy of the general log is placed on the summary board with the right edge of the log at the right end of the summary board or peg bar. This sheet is used to record the summaries for the period or for the day. Next, the first completed log sheet is placed on the board in a position one peg to the left of the first sheet. With the logs placed in this manner only the code summary column of the first log is visible.

By moving each succeeding log one peg to the left, only the code summary columns of the logs are visible on all the sheets, and a very small amount of time is required to assemble the logs on the summary board. The totals for each code can then be taken directly from the original log sheets which are held in perfect alignment on the board.

A summary board, generally is equipped with a line finder which guides the eyes of the operator along the correct horizontal line. The line finder swivels on the support rod, moves easily up or down as regulated by operation of the control knob.

The procedures outlined in the foregoing paragraphs demonstrate how simple it is for any telephone company to develop a summary or analysis of maintenance operations directly from the general log sheet. In the long run, a good maintenance log will help the company give better service. This is one of the primary objectives of the standards of service set forth in PART 61 (TELEPHONY, Dec. 6, 1952, p. 17) of this series.

In most of the larger central offices, an accumulated record of general log results is maintained on a daily basis. The medium or small office may be able to dispense with this record. Instead, a monthly or quarterly summary may be developed through use of the summary board strip plan of accounting.

One of the ways in which a good general log helps to improve service is by revealing the amount of trouble that develops in the various classifications of exchange plant. In this way any particular classification, such as central office equipment, can be compared on a percentage basis with the composite picture.

After a short while, a normal trouble expectancy can be determined for the various codes. It should be remembered that an expectancy or objective is based upon average conditions. Troubles in basic outside plant generally reflect a sharp increase in protector trouble. Perhaps, the one plant classification least subject to weather conditions is central office equipment.

However, central office equipment trouble tends to increase whenever

GENERAL LOG
EXCHANGE PLANT REPORTS

DATE _____

WEATHER _____

TIME	TELEPHONE NUMBER	TROUBLE REPORTED	CLASS S	CLASS C	CODE	HOURS	REMARKS	CODE SUMMARY
								1
								2
								3
								4
								5
								6
								10
								11
								12
								20
								21
								22
								30
								40
								50
								60
								TOK
								FOK
								EX.
		TOTAL						

NOTES:

AVERAGE HOURS	
TOTAL REPORTS	
TIME INDEX EQUAL OR UNDER	
INDEX—%	

Fig. 1

there is an unusual amount of jumper rearrangements or other plant work in the exchange. For this reason, good training and careful coordination of these big jobs pays good dividends in holding down trouble reports.

Aside from abnormal conditions, other maintenance trends may be reflected by the trouble results. For example, there usually are a number of indications of central office equipment trouble before an actual service failure occurs. Among these sources of information are trouble reports which are closed as "test O.K." or "found O.K."

With relatively few exceptions, there is a reason for every trouble report. At least this should be the belief of the repairman or maintenance man while he is working on a reported trouble. With this thought in mind, the repairman should make a thorough inspection of the particular line. In conjunction with visual inspection, various electrical tests of fuses, cords, contacts, ringer coils, etc., should be made, depending upon the trouble the customer claims occurred. In some instances, a series of operating tests will "bring in" the trouble where other tests failed.

There are many fine examples of how extended operating tests have helped to locate causes of chronic trouble where the visual tests and inspections failed. In dial switching systems, a subscriber call can be completed over any one of a number of switches or channels. The particular channel selected is chosen on a preference basis. One channel or switching route is the first choice route, another is second choice, next is third choice, etc., through the entire group, until all of the circuits in the group are in use. From the foregoing, it is quite apparent that if one of the higher choice channels of a group of 20 circuits has a poor contact in the talk circuit, a customer may occasionally experience trouble on a completed call.

In the above case the report might be "noisy," "can't hear," "can't be heard," "noisy at times," "scratching noise," "bell rings, no one on line," or even the all-inclusive statement, "out of order." The important thing to remember when the fault-locating procedures start is the fact that there must have been a reason for the customer's report.

From this point on, the repairman has to judge each case on its own merits in locating the cause of the trouble. While attempting to pin a case down to a specific cause, the repairman should consider the fact that, as a rule, 20 to 25 per cent of all cus-

(Please turn to page 86)

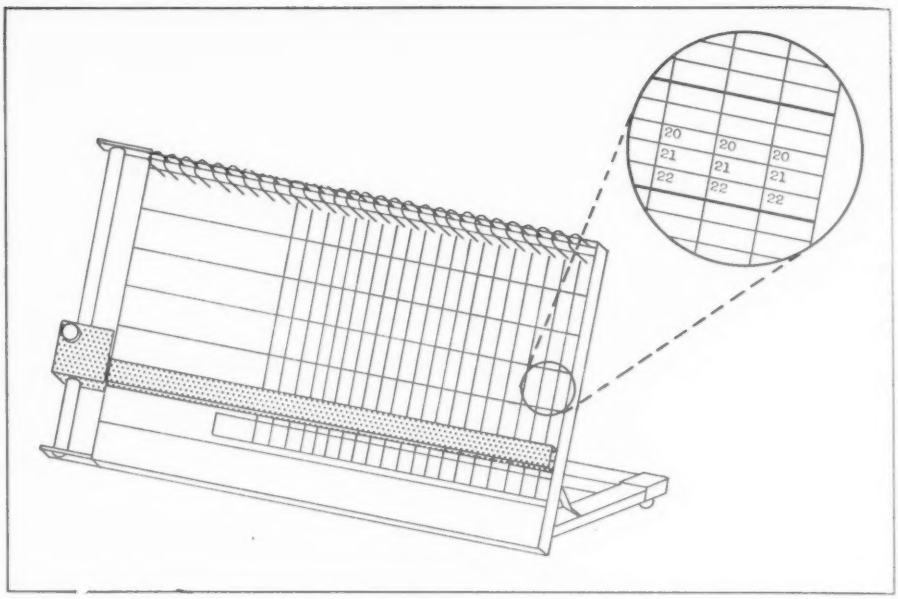


Fig. 2

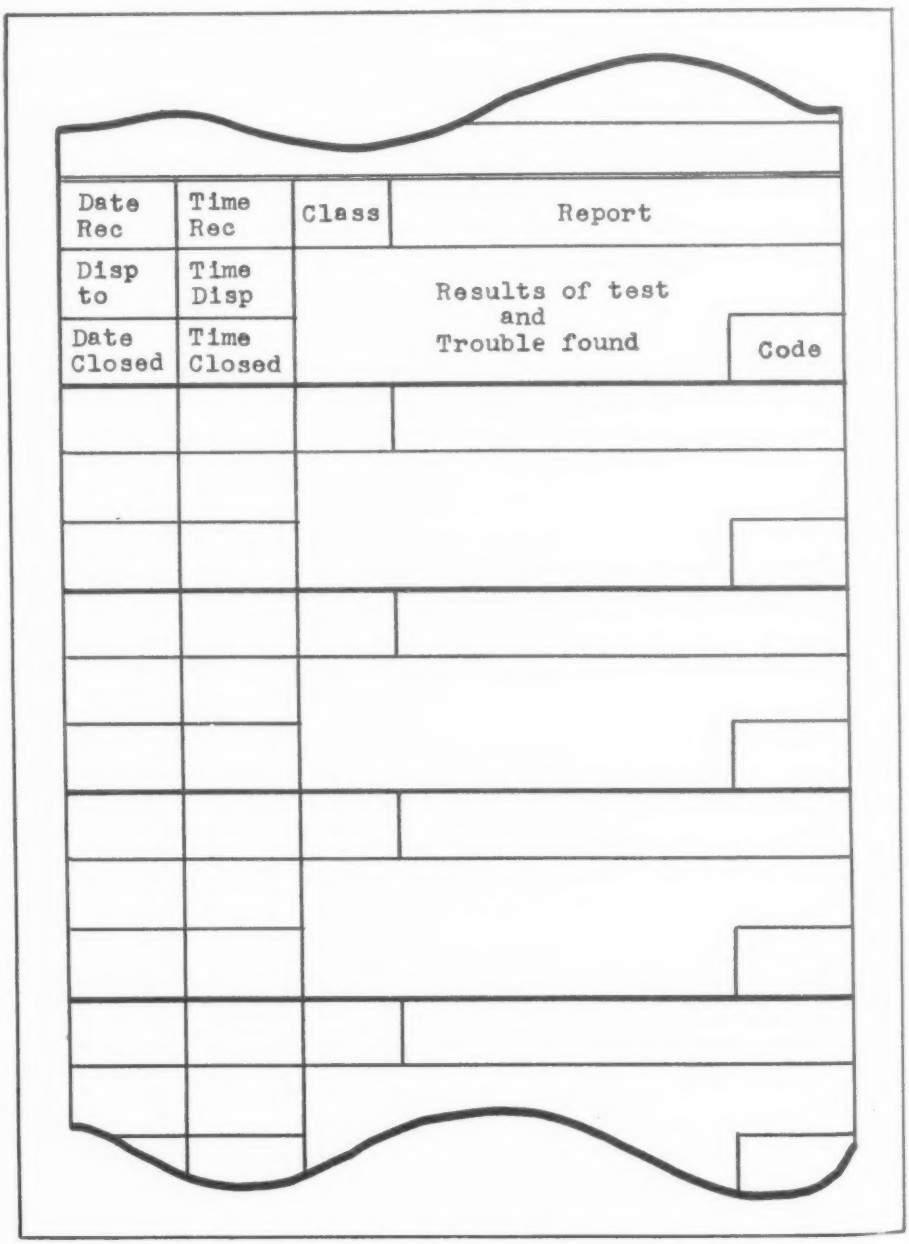


Fig. 3

Microfilming Toll Tickets

By P. M. FERGUSON JR.
Assistant Manager and Engineer
Mankato (Minn.) Citizens Telephone Co.

LONG DISTANCE SERVICE AND TELEGRAMS

TEL. NO. 5281

	SERVICE	TAX
CALLS OVER 24¢	30	08
CALLS UNDER 25¢	50	08
TELEGRAMS		
NON—TAXABLE ITEMS		
TOTAL CARRIED TO BILL	.96	

FEDERAL TAX SCHEDULE

TELEPHONE MESSAGES OVER 24¢ 25%
TELEGRAPH MESSAGES 15%
TELEPHONE MESSAGES UNDER 25¢ 15%

THIS IS A STATEMENT OF THE TOTAL TOLL SERVICE AND TELEGRAM CHARGES INCLUDED ON THE ENCLOSED BILL.

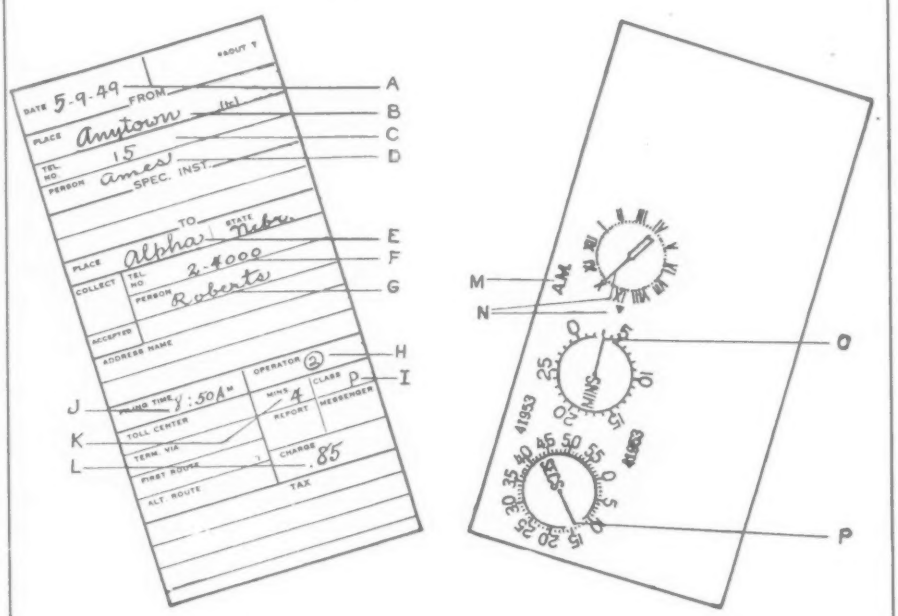
THE ENCLOSED TICKETS EXPLAIN THESE CHARGES.

SHOULD YOU HAVE ANY QUESTION REGARDING THE TOLL CHARGES. PLEASE. IF POSSIBLE. BRING OR SEND THE TICKETS IN QUESTION TO OUR OFFICE SO WE MAY INVESTIGATE THE MATTER.

THE MANKATO CITIZENS TELEPHONE COMPANY
MCT 215

Fig. 1

HOW TO READ A TOLL TICKET



FRONT

BACK

A. The date the call was placed.
B. The name of the town and state in which calling party is located.
C. The number from which the call was placed.
D. The name of the party placing the call. (The long distance operator writes the name phonetically, that is, the way it sounds to her over the telephone.)
E. The name of the town and state in which called party is located.
F. The telephone number of the called party or station.
G. The name of the called party.
H. The number of the operator handling the call.
I. The classification of the call, that is, person-to-person or station-to-station
J. The time the call was placed.
K. The number of minutes charged on the call.
L. The amount billed for the call. This does not include the tax.

M. A.M. - Indicates that the call was placed between midnight and 12 o'clock noon. P.M. would indicate that the call was placed between 12 o'clock noon and midnight.
N. Indicates the charge started at 8:50 A.M. The triangle corresponds to an hour hand and the arrow to a minute hand.
O. Indicates the time elapsed in minutes since the charge started.
P. Arrow "P" supplements arrow "O" and shows in seconds that portion of the time elapsed which cannot be accurately determined by the minute hand (arrow "O") When arrow "P" has passed the 5 second mark, charges for an additional minute are applied on calls within the State. When the arrow has passed the 15 second mark, charges for an additional minute are applied on calls outside the State.

Fig. 2

ONE OF THE most gratifying facets of the telephone industry is the innate friendliness of the men and women engaged in this great business. There seems to be no professional jealousy or hiding of information. Regardless of whether you are a member of the Independent segment of the industry or a member of the Bell System, information on any subject is gladly shared by telephone men and women. Our company was privileged last year to receive from its friends in the industry information which increased its efficiency and pleased the subscribers.

A year ago our company was faced with the loss of one of our key women in the toll billing department. On top of that, our load on this section of our commercial office was getting heavier each month. Even though our toll revenue was not increasing appreciably, the number of toll tickets to be billed each month was increasing. Because of these factors, we began looking for machines and methods which would allow us to improve the speed of our toll billing.

One business machine company showed us a wonderful combination adding and typing machine which would have decreased the number of

operations in totaling the amounts of the subscribers' bills, but it still necessitated making an itemized toll statement for each subscriber who placed toll calls. For the amount of tickets we handle each month, we would have needed two or three of these "super" machines and the cost of each one was approximately $5,500.

We then thought of asking other companies what machines and what methods they were using. One of these companies was the Lincoln (Neb.) Telephone & Telegraph Co. After talking with the auditor of the Lincoln company, I. J. Devoe, we decided to visit Lincoln and see their method in operation. We found that the Lincoln company was using the microfilm method.

Now, we had heard of this method before, but we learned that the Lincoln company had added a "new wrinkle."

After the toll tickets were sorted in the usual manner by subscribers' numbers, they were sent to comptometer operators for the totaling of the charges on the tickets for each subscriber. The total amount of the calls over 25 cents was added and placed on one section of a "facer" ticket (shown in *Fig. 1*) with the proper amount of the federal "nuisance" or excise tax. On another line the total amount of calls less than 25 cents was entered with its "nuisance" tax. Now the facer ticket is actually a double ticket with a carbon between the two slips, and they are the same size as the standard toll ticket. The top ticket is a green ticket and after the amounts of all the toll calls and taxes are totaled, the two parts of the "facer" ticket are separated by quickly tearing off the tab at the top. The green ticket is placed on top or in front of the toll tickets for the subscriber. Thus, when the tickets are photographed, a green facer ticket is photographed with the subscribers' tickets and, as stated before, this gives the total toll and tax charges for the subscriber. The pink or bottom facer tickets go to the billing machine operator along with the associated subscribers' monthly rental cards.

In this manner the billing machine operator can proceed immediately with making out the monthly statement for the subscriber while, at the same time, the toll tickets are being photographed for the company's records. After the billing operation, the pink facer ticket can be thrown away.

After the facer tickets and toll tickets are photographed, they are easily sorted by the use of the green facer ticket. The facer ticket and toll tickets for the subscriber are then placed with the regular monthly statement in an envelope and are ready for mailing.

P. M. FERGUSON, V. P., and GEN. MANAGER

S. B. WILSON - PRESIDENT
W. D. WILLARD - SEC'Y and TREAS.

Offices 315 South Second Street
MANKATO, MINNESOTA
TEL. 4695

INCORPORATED 1898

Dear Subscriber:

Beginning with your next telephone statement we are starting a new system for billing long distance calls. As usual, the total charges for calls, including federal tax, will appear on the face of your rental statement, but in place of an attached itemization of your calls you will receive the original toll tickets as made out by the operators.

The tickets will provide you with a complete record of your calls. A brief study of the attached instruction sheet will enable you to analyze your tickets without any difficulty. Please bear in mind that operators are instructed to spell names as they sound rather than make any attempt at correct spelling. This will account for some odd spelling that may occasionally appear on a ticket.

Adjustments for incorrect charges or for an occasional call charged to the wrong account may be handled either by telephone or in person at the business office. The ticket in question should either be brought to the office or mailed whichever is most convenient. A record of your calls will be retained by the company on microfilm for future reference if necessary.

Since this plan is new, we will appreciate receiving your comments and suggestions concerning it.

Yours very truly,

MANKATO CITIZENS TELEPHONE COMPANY

O. M. Ferguson Jr.

Assistant Manager & Engineer

Reproduction of letter which the Mankato Citizens Telephone Co. sent to its subscribers announcing the adoption of its new system for billing long distance calls.

Frankly speaking, it was sort of a let-down to see the photographing machine. An attendant just fed batch after batch of tickets into the machine, and every so often emptied the hopper of the tickets that were photographed, restacked them and sent them to another department for the sorting and mailing.

There was little doubt in our minds, after seeing this method, as to what type of equipment we were going to buy. There were a lot of questions we asked the Lincoln people and quite a few details we examined further. The friendliness and cooperation of telephone people was never more in evidence than that day we spent at the Lincoln company. Probably you have in mind the same questions we asked, so here are a few of them.

Having a Scotchman as the general manager of our company, we wanted to know about the cost of mailing the tickets. We found out that approximately 22 to 23 toll tickets with their facer ticket can be mailed with the monthly bill for 3 cents. You will find that the vast majority of your subscribers average less than 20 toll calls per month. For our real large toll users we follow the Lincoln company's practice and deliver them, which takes less than an hour's time each month. For the medium toll users we use a special-sized envelope. The mailing problem is not a major one and the additional mailing cost is more than recovered by the saving in typing time.

How did we announce it? We sent out a letter to each subscriber informing him of the coming change. We also got from the Lincoln company their instruction sheet (shown in *Fig. 2*), entitled "How to Read a Toll Ticket." This shows the front and back of a sample toll ticket and each entry is fully explained. We also by coincidence held an open house for the Wholesalers & Manufacturers Association of Mankato about a month before

(Please turn to page 73)

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

THE WRITER, in the company of Col. William D. Hamlin, Signal Corps, made a rush trip to Alaska recently to investigate communications work which presently is underway in that far-north country. Two 3-CL switchboards, and considerable additional telephone carrier equipment, are now in the process of installation which will provide additional toll communication facilities in that northwest territory.

We left Washington, D. C., by air on the morning of Mar. 26, arriving in Seattle the same evening. One day was spent at the headquarters of the Alaska Communications System, located in Seattle, and on the morning of Mar. 28 we flew to Anchorage in a Northwest Airlines Stratocruiser in an even six hours. This was a wonderfully smooth ride in a truly luxurious aircraft. The sun shone brightly for the most part and we have hopes that some of the color photos we snapped of snow-covered mountain peaks along the wild coastline will turn out well.

We paid a visit to the city of Anchorage telephone exchange and enjoyed a chat with L. R. Zinns, superintendent of the telephone department, and his staff. We found these men busy installing a 1,000-line crossbar addition to the Kellogg "Relaymatic" central office equipment. This city presently is suffering acute growing pains and a large backlog of orders is constantly on hand. Everyone in Alaska appears to be prosperous and has plenty of money to spend. They even refer to silver dollars as Alaskan pennies.

While in Anchorage, the writer had occasion to telephone F. M. Parsons, of the Kellogg Switchboard & Supply Co. in Chicago, for some engineering information. The call went through promptly and the transmission was excellent. This call was made at 9 a.m. Anchorage time, which was 2 p.m. Chicago time.

After spending three days in the Anchorage area, we departed for Fairbanks on an Alaska Airlines DC-3 plane. This flight is over extremely rough terrain and it appeared that we dodged by a rather close margin a few cloud-shrouded mountain peaks. These clouds, with hard centers, prove to be a serious flying hazard in Alaska, but flights are made in practically every type of aircraft conceivable.

While in Fairbanks we called on L. M. Glascoe, superintendent of the telephone department for that city. During this visit, we enjoyed a trip through the telephone exchange. This is a Strowger step by step system of Automatic Electric Co. manufacture, well engineered and installed in a modern new fireproof building. Like everything else in Alaska, this system is also suffering growing pains and new additions are in prospect. Party line service is accepted gladly and a big backlog of orders is on file at all times.

Much to our surprise, the weather was excellent in Alaska for this time of the year. There was very little snow. The temperature went down slightly below freezing at night, but the days were warm. The temperature went up to 60 degrees one day in Anchorage while we were there and it was 45 degrees in Fairbanks. The Fairbanks area had had only about 25 inches of snow during the entire winter.

"Everyone should have a hobby. In my spare time I like to weave."

Telephone construction in Alaska, even outside plant, is carried on throughout the winter. It is understood that this work is not as efficient during the long arctic nights by artificial light as it is in daylight, but it is carried on nevertheless.

While in Alaska, we also visited three different North Electric all-relay dial exchanges. One of these exchanges had only recently been installed and is to be cut over shortly after final touches have been completed on the outside cable distribution system. This cable system, for the most part, was completed, splicing and all, during the past winter.

On the morning of Apr. 2, we boarded a Pan American Clipper at Fairbanks bound for Seattle. After an uneventful flight of a little over eight hours, we arrived in Seattle where we had to pass through customs and prove that we were native born American citizens. During this flight, the writer went up forward and was somewhat startled to note that the windows in the cockpit were all frosted over so that it was impossible to see through them. Apparently, this did not bother the pilots for they were on instruments anyway and, having been over the same ground so often, the scenery undoubtedly did not hold any interest for them.

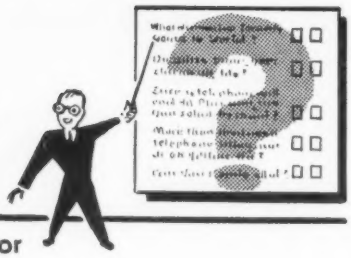
After a night's rest in Seattle, we boarded a United Airlines DC-6B for Washington where we arrived safely that same evening. During this flight, between Seattle and Denver, we averaged 356 miles per hour for a part of the distance.

It is rather amazing that we could travel over 10,000 miles and see so many people and accomplish so much in less than an eight-day period. We will never cease to marvel at the wonders of modern air travel.

V V

It has been said that egotism is the art of seeing things in yourself that others cannot see.

PLANT MAN'S QUIZ



by RAY BLAIN, Technical Editor

Q. We frequently find a high resistance connection due to corrosion where a ground wire is connected to a pipe or a ground rod by using a ground clamp. These connections cannot be soldered conveniently and we should be pleased to have your ideas as to how corrosion and high resistance may be prevented.

A. It is suggested that you make use of a weather-proof putty-like insulating compound that is available at the present time for the prevention of oxides and corrosion in connections of this type.

This compound is applied by kneading it over the connector to be protected. It forms a permanent plastic coating, impervious to moisture and contaminating atmospheres. By sealing out oxidization and corrosion, the original low resistance of the connection is maintained. This compound may be procured from your telephone supply house.

• • •

Q. We frequently have customers request our company to install buzzer systems in their offices. Is the provision of this service considered desirable for an operating telephone company?

A. It is believed that, in most cases, operating companies should not install buzzer systems except when they are required for use as a signaling arrangement between two telephone stations. Such buzzer systems are provided occasionally by an operating telephone company for use in connection with key telephone installations or wiring plans.

• • •

Q. Our customers sometimes request that station wiring be concealed in residences. This practice is objected to, however, as the labor charge is much higher than for an exposed wiring job. Is our attitude in this respect considered reasonable?

A. Exposed wiring in a residence is usually an unsightly dust catcher, and is to be avoided whenever it proves convenient to do so. This is especially true of new houses. It is, therefore, highly desirable to place conduits while the house is under construction so that the wiring may be concealed without special effort. Concealing wiring in old houses is in general rather expensive, and in some cases almost impossible and is usually discouraged.

• • •

Q. In the construction of a concrete manhole, is the use of reinforcement rods considered necessary to provide adequate strength?

A. Reinforcement rods might not be absolutely necessary in every case, but they cost very little and we would recommend their use in the interest of safety. These rods should be placed both in the sidewalls and the top. The bottom does not require this reinforcement. It is necessary also to provide concrete inserts for attaching cable racks later. It is also a very good plan to provide pulling-in irons as a part of the manhole structure.

• • •

Q. What tests should be made to determine when drop wire in an exchange distribution plant should be replaced?

A. It is a good plan to make a thorough visual inspection of all drop wire in a plant at regular intervals. Make certain that all spans have the required amount of slack and the proper clearance from trees and power circuits. Wet weather insulation tests should also be made occasionally and all drop wire indicating leakage should be replaced.

Today drop wire is much improved in quality over that available a few years ago, and if properly installed it causes very little trouble. If you have some of the old type drop wire in your plant, it will probably prove desirable to replace it with the least possible delay and before it causes trouble.

• • •

Q. Will the installation of 10 parallel type drop wires in a ring run for a distance of about 300 feet along a building, prove satisfactory or will there be cross-talk between the pairs? We have been told that twisted pair must be used for this purpose.

A. We doubt if bothersome cross-talk will be experienced if the parallel type wire is twisted occasionally during the process of installation. It is suggested, however, that you consider the installation of a 10-pair cable rather than this long wire run. In our opinion, the cable will provide better service and will prove a better investment in the long run.

• • •

Q. When a protected cable terminal is installed on an aerial cable lead, will it be satisfactory to ground the protector to the strand or will it be necessary to run a separate ground wire and drive a ground rod?

A. If the cable and strand are well grounded there is no reason why the terminal cannot be connected to the strand. Terminals of this type are frequently grounded by running a No. 14, or larger, ground wire from the terminal ground post and connecting it to the strand by the use of a strand wire clamp. If the eye-bolt method of deadending and guying is used, the ground strand clamp may be placed on the neck of the strand deadend, if convenient.

• • •

Q. We have several runs of aerial cable where we are unable to obtain proper tree clearance. In your opinion, may we expect trouble from abrasion if the lead cable is not properly protected?

A. The best arrangement, of course, is to trim the trees so that they will be clear of the cable. When this cannot be accomplished, as in your case, then the next best arrangement is to protect the cable against abrasion. This can be accomplished by the installation of a tree guard which consists of a square box built around the cable and strand to hold it from contacting the tree. In some cases, you may also be able to use screw eyes and wire to pull the strand away from the tree. If a lead cable is permitted to lie against a tree the abrasion and vibration will in time often cause sheath trouble.

V V

"Public opinion polls have demonstrated that many Americans—too many Americans—still suspect many big business bosses of much greed, few scruples; partly, I imagine, because we have been so articulate about our system and so inarticulate about this 'something else' beyond the material or visible returns. Sure, everyone knows what we're against. But what are we for? What are we, as businessmen, for? In our public incantations, let's let people know that, too."—CHARLES ALLEN THOMAS, president, Monsanto Chemical Co.

.... From MAGNETO To DIAL

in the Smaller Exchange

By DANIEL SEITZ
Plant Superintendent
York (Pa.) Telephone & Telegraph Co.

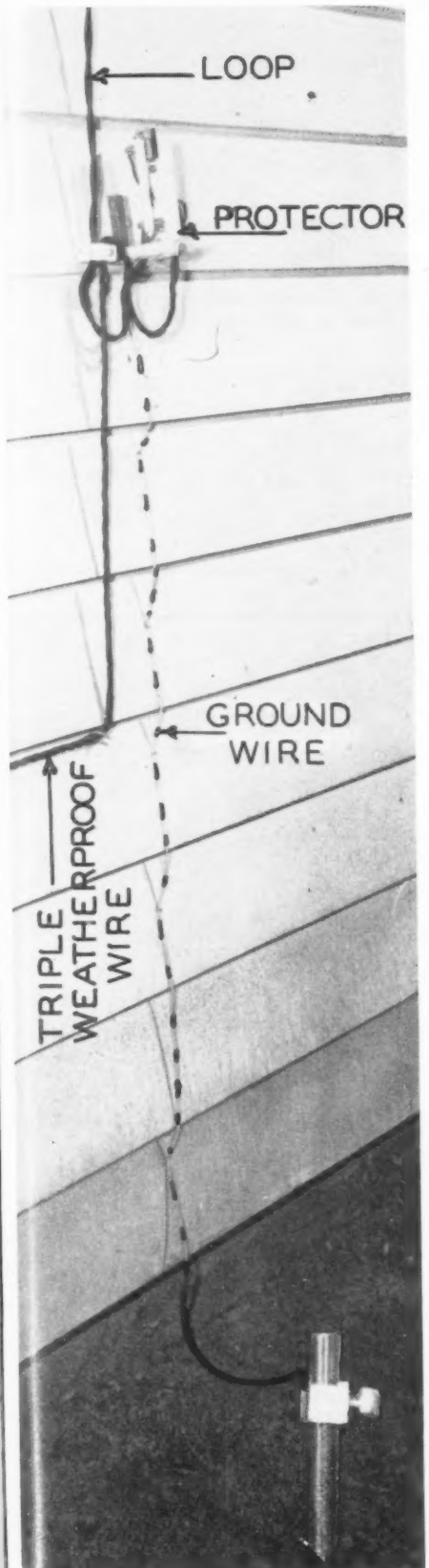


Fig. 2. Outdoor arrester with cover removed, showing ground rod location.

THERE are several methods that may be followed when converting an exchange from magneto to dial operation with each suited to the particular job to be done. Therefore, we should like to begin with the very small plant where no cable is involved.

The first step should be the inspection of all open iron or steel line wire for high resistance hand-joints and replacement of them with compression sleeves; also the clearance of open wire through trees and replacement of all broken and missing insulators.

While a dial system is far superior to manual operation, it would be unreasonable to expect good dial service over a line which is not satisfactory for manual use.

If the line wire is very rusty, it should be replaced, and the right time to do the job is before the dial equipment is placed in operation.

Circuit Characteristics

There are three important factors involved regarding the circuit between the central office and the subscriber's station.

A. *Circuit Resistance.* The total resistance of the circuit may not exceed a specified limit, which is generally 1,000 ohms.

Any high resistance joints would not only cause noise on the line, but they would affect the transmission adversely, and also interfere with the proper operation of the central office equipment.

For example: We have a No. 109 open iron wire circuit 12 miles long.

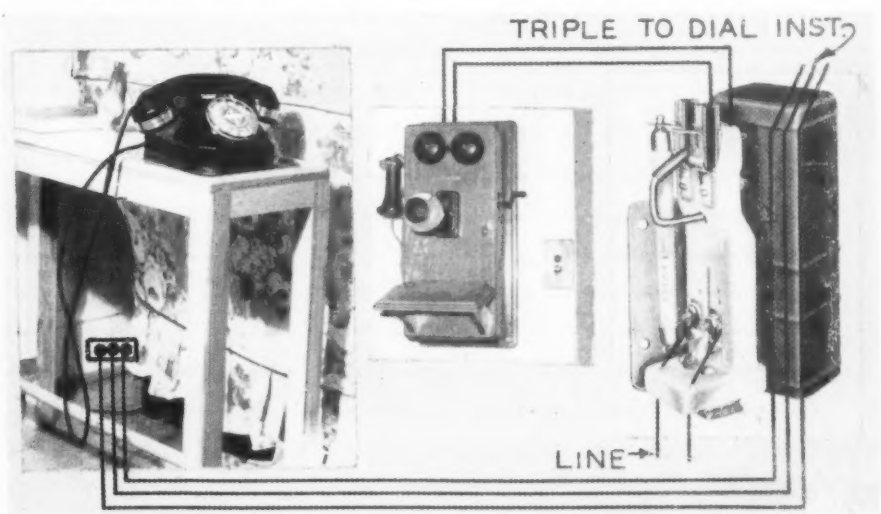
The total loop resistance should be 792 ohms. Now if we had one or more bad joints with a combined resistance of 500 ohms, it would mean that our total loop resistance would be 1,292 ohms or 292 ohms in excess of the 1,000 ohm specified limit.

High resistance joints are more easily located in a magneto line than after it is converted to dial operation. Therefore, any suspected or measured high resistance joints should be removed before the cut-over.

B. *Central Office Equipment.* All central office equipment is designed to operate with certain leakage between the line wires, and from the wires to ground.

Bad tree conditions, especially in wet weather, may provide a path from wire

Fig. 1. Magneto to dial station arrangement for cutting over one line at a time.



to wire, or to ground, that will trip the ringing or, in extreme cases, cause complete service interruption.

Leakages other than tree faults such as normal moisture paths from wire to wire by way of the insulators, cross arms, brackets and poles are usually widely distributed, causing a high resistance trouble, which seldom interferes with the central office dial equipment operation.

C. *Transmission Requirements.* Transmission is the third and equally important factor to be considered when planning any line and has been taken into consideration during the preparation of *Tables I* and *II*, showing the miles of open wire and cable that may be used on a 48-volt dial system exceeding a 1,000-ohm resistance loop, or 10 db transmission loss.

The second step in the preparation for dial service should be the installation of the subscriber's equipment at which time the opportunity to make a lasting trouble free job should not be overlooked.

The instrument should be located so as to be clear of all electrical appli-

(Please turn to page 38)

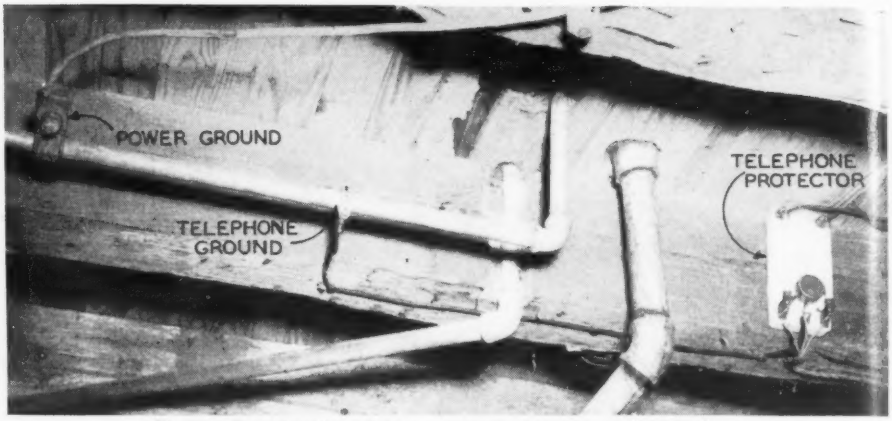


Fig. 3. Unsatisfactory indoor protector location and grounding.

Miles of open wire that may be used on a 48-volt dial system not exceeding a 1,000-ohm resistance loop, or 10 db transmission loss.

(A)	No. 12 B.W.G. .109 B.B. Iron Wire	15.0 Miles
(B)	No. 12 B.W.G. .109 E.B.B. Iron Wore	17.5 Miles
(C)	No. 85 .109 Steel Wire	14.6 Miles
(D)	No. 135 .109 Steel Wire	13.0 Miles
(E)	No. .080 Copperweld 40 Per Cent Wire	23.0 Miles
(F)	No. 104 Copperweld 30 Per Cent Wire	29.0 Miles
(G)	No. 104 Copperweld 40 Per Cent Wire	38.6 Miles
(H)	No. 104 Hard Drawn Copper	95.2 Miles

TABLE I

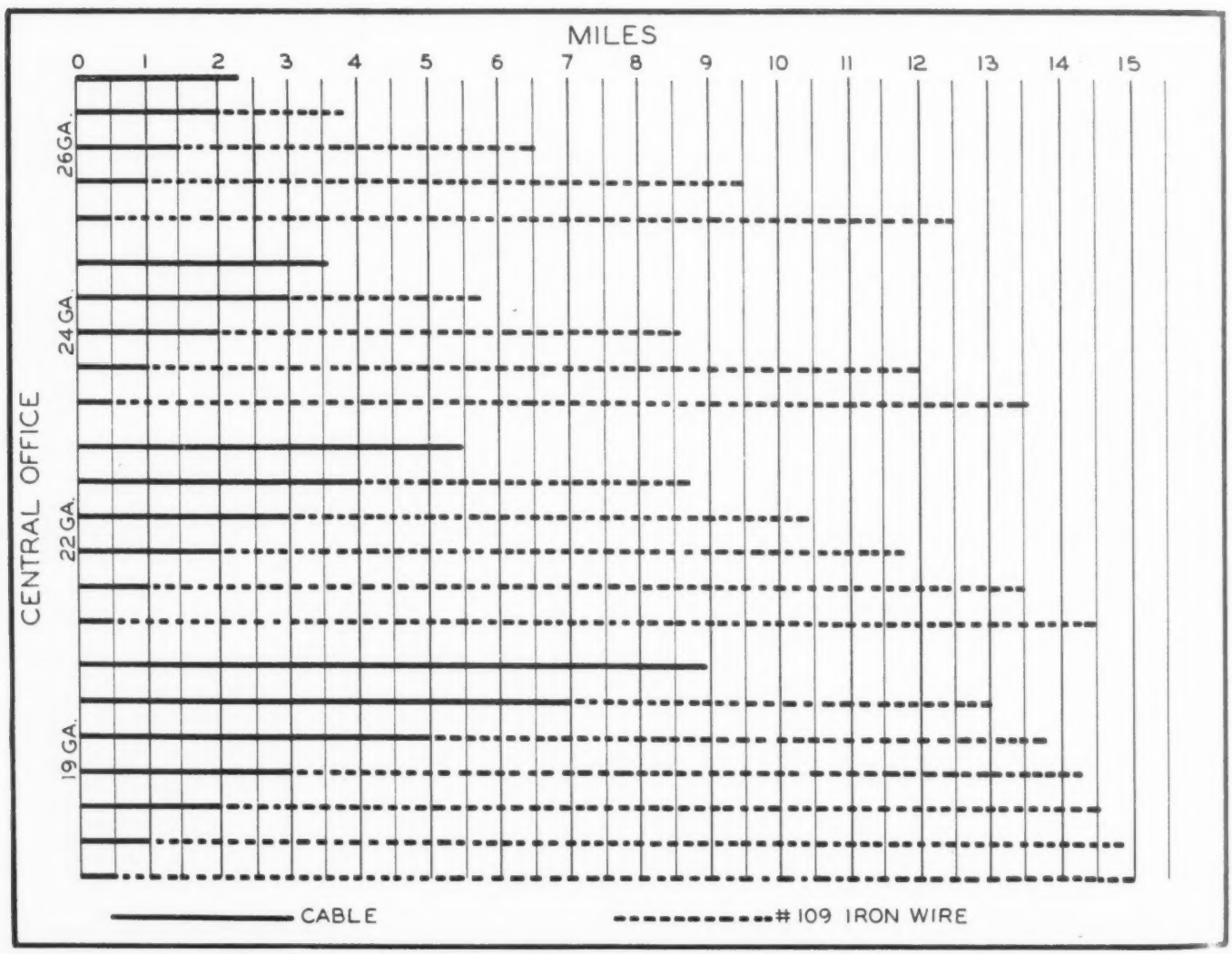


Fig. 4. Cable and open wire combinations providing circuits within 1,000-ohm loop and 10 db transmission limits.

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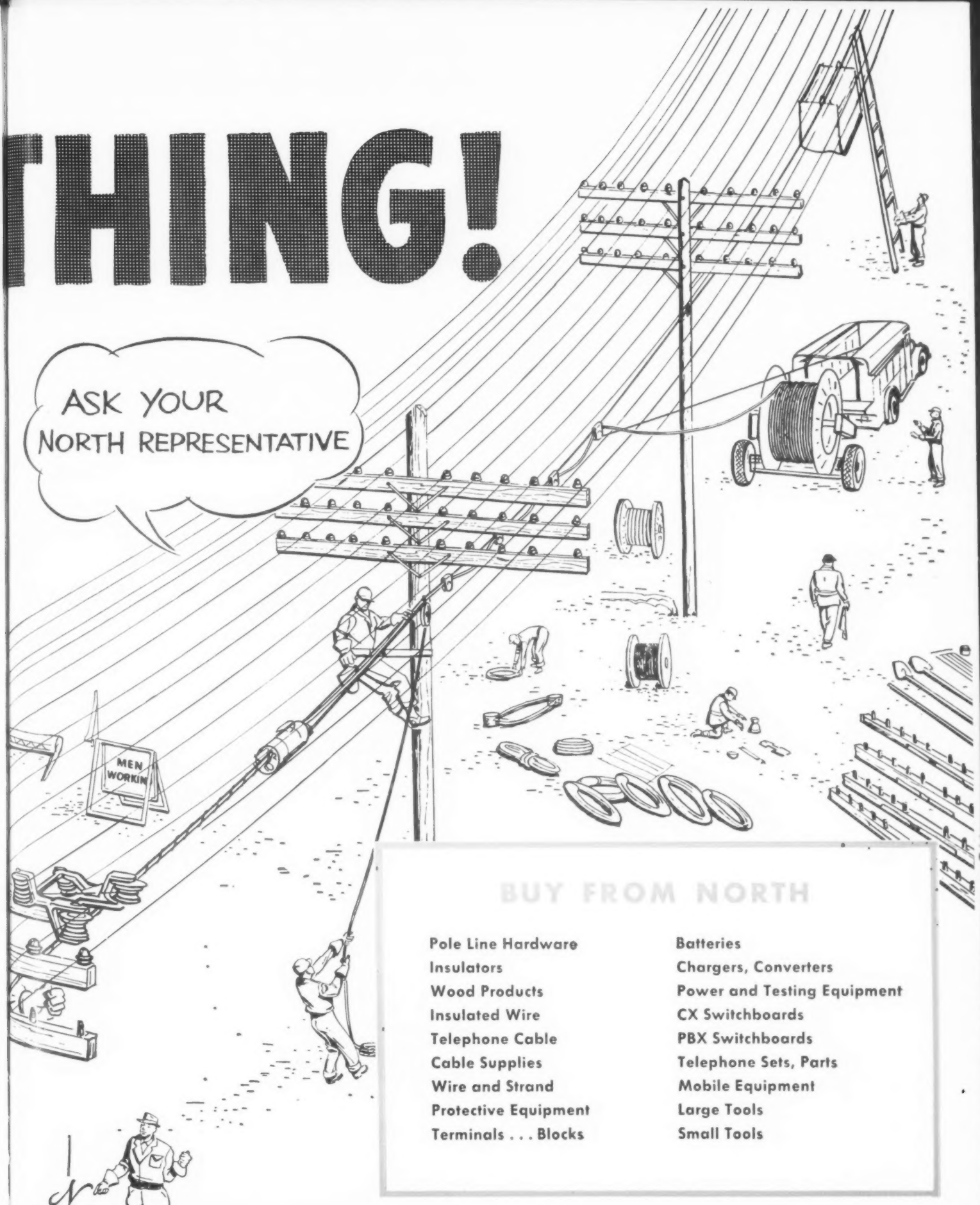

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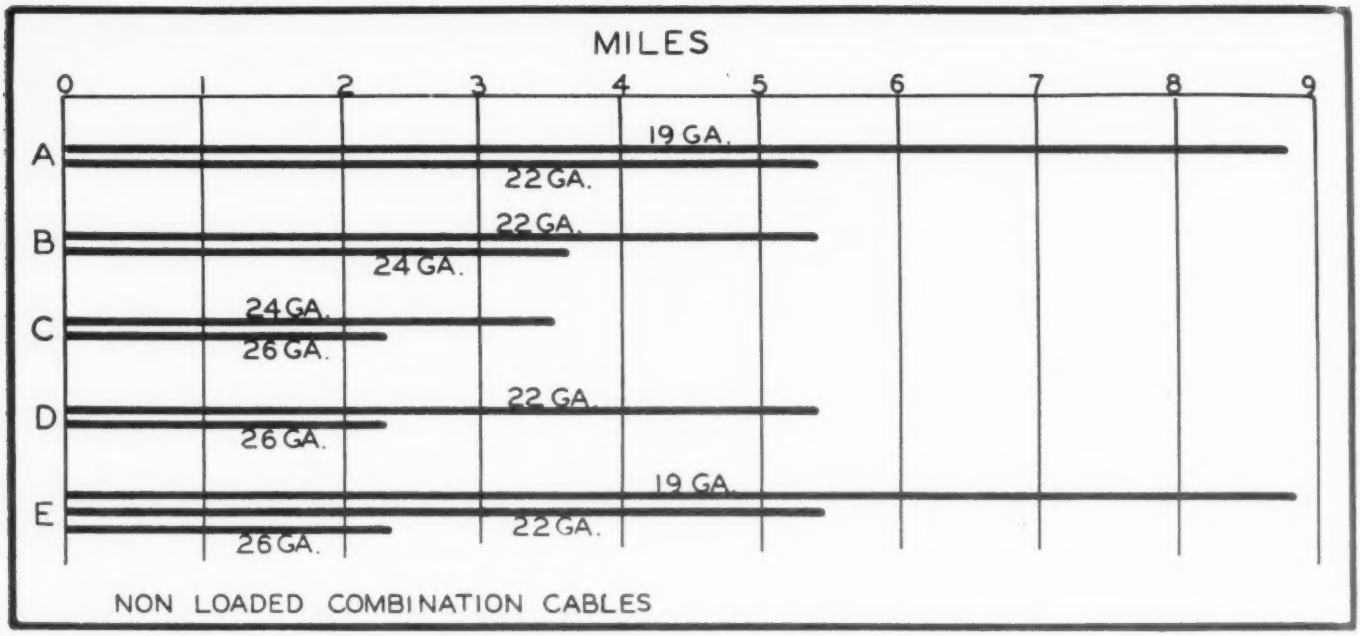

Fig. 5. Several of possible cable gauge combinations.

ances, lamps, wires, conduits, pipes, etc., so that any lightning either on the power or telephone line will not have an opportunity to discharge from one to the other. When the subscriber designates a location where subsequent damage is very likely to occur to the instrument wiring or other apparatus, it is wise to be tactful in helping to select an alternate safe, as well as convenient, location.

In most cases, it will be found economical to renew all inside wiring, selecting a dry location for the wire and well away from wires, pipes, etc.

Fig. 1 shows a magneto to dial installation with the triple wire ended at the protector block ready for connecting at cut-over time.

Outdoor Arresters

In rural areas a suitable arrester installed outdoors will have many advantages, especially when shooting trouble for testing and replacing fuses.

Fig. 2 shows a protector mounted within reach from the ground and triple weatherproof wire used from the protector to the connecting block near the instrument.

The ground rod is driven in solid ground and not in the loose earth fill around the foundation wall. The ground wire is then placed in a small trench from the wall to the ground rod.

Miles of cable that may be used on a 48-volt dial system not exceeding a 1,000-ohm resistance loop or 10 db transmission loss.

	Miles
(A) No. 26 Gauge Cable...	2.25
(B) No. 24 Gauge Cable...	3.60
(C) No. 22 Gauge Cable...	5.4
(D) No. 19 Gauge Cable...	8.8
(E) No. 16 Gauge Cable...	12.7
(F) No. 13 Gauge Cable...	20.4

TABLE II

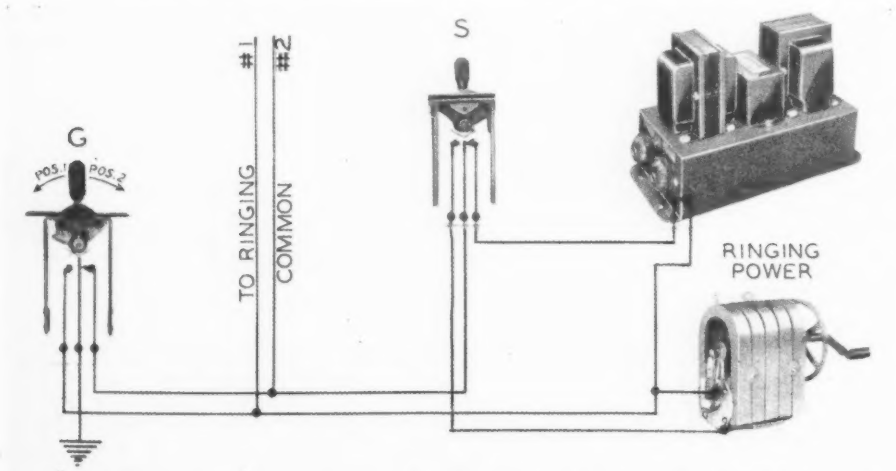

Fig. 6. Ringing power arrangement on small magneto board in preparation for dial conversion.

If the protector used must be an indoor type, be sure to install it properly indoors.

Fig. 3 illustrates several faults that can be avoided. *First:* The protector should not be grounded to the same pipe of an isolated water system together with a power ground. *Second:* The protector is likely to become wet from pipe and equipment leakage.

The illustration shows several other features such as good ground clamp, heavy ground wire and the protector mounted properly in a vertical position.

Actual Cut-Over

Now, when all the lines are in good condition, the subscriber station equipment has been properly installed, and the central office completed, we are ready to cut over, our plan being to cut over one line at a time.

The first step of the actual cut-over would be to disconnect a line from the magneto switchboard and connect it to the proper line on the dial equipment.

This will cause the dial equipment to plunge because of the short caused by the magneto sets being connected to the line.

If the central office includes the lock-out feature, the line will automatically be locked out in a specified time (approximately 1½ minutes). Then we start from the central office and disconnect *all* magneto telephones and call bells until the final magneto instrument has been disconnected from the line.

In the meantime, do not connect any of the dial telephones until the last magneto set has been disconnected.

If *every* magneto telephone and call bell has been disconnected, we will now

(Please turn to page 71)

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7 Sources of Assistance For the Small Companies

By L. N. MARTIN

THE English language abounds in adages, proverbs, and trite sayings which some people believe to be "gospel truth" just because they are venerable. Most of them contain a grain of truth when properly applied and correctly interpreted. Some are false and misleading. The saying which we now have in mind is: *"Experience is the best teacher."*

We do not fully agree with this. If this proverb were changed to "Experience is the highest priced teacher," we would agree. Then some people would argue that the highest priced teacher would in fact be the best teacher. We do not agree with that either. Now we do not mean to depreciate the value of practical experience. If we should see the motto "Practical experience is an invaluable asset" we would heartily agree to that.

Why is experience such a costly teacher? Because we pay for it with our lives, i.e., with years and years of time. Also, a number of costly mistakes are sure to be included in the bill.

If by "experience" we mean "personal experience" then it can account for only a small part of any man's learning. A man learns to read and write in his first few years of school but he does not by personal experience develop a system of reading and writing. The English language has developed through centuries of experience, the experience of scholars and of common people. Yet a child learns to read and write in a few years.

If by "experience" we mean not only personal experience but the experience of others, both past and present, then our motto takes a new meaning and could be written: *"Experience (our own experience, the experience of others in the same line of endeavor, the experience of the ages) is the best teacher."*

This discussion of how people learn could be carried on indefinitely so we will get down to our real subject.

We are interested in the telephone man and especially the small company man from lineman to manager, president, or owner. How does he learn his job? How does he continue to learn as long as he is able to work?

Let us first look at two familiar characters. One is "John," past middle age. He quit school in the seventh grade to go to work for the telephone company. He has had years of practical experience in the same job, but he did not acquire a basic education before he went to work and he has learned very little since then. He has not studied. He has not read. He often boasts of his many years of experience. He believes that he is qualified for the general manager's job. He receives a rough jolt when a much younger man is placed over him.

Now, let us look at the other character—"Bill." He has a college degree and has worked for the telephone company less than a year. He is proud of his education and holds in contempt some of the older "self-educated" men. He is quite sure that they can teach him nothing. He, too, thinks that he should be general manager.

Which of these two men is more worthy of pity? The college man may fare better because he should have learned to think, reason, and study during his college course. If, and when, he realizes that his telephone education has just started, he should know how to go about learning the business.

These two men really have the same trouble. Both have ceased to learn. One because he thinks that his own (really little) experience is all that is necessary, and the other because he believes that his learning days ended when he finished college.

A telephone man should start with the best education he can obtain. However, an organization in which every employe has a college degree would be—well—somewhat unbalanced. (And it is not likely to occur). The most valuable thing learned in school is *how to learn.* How to find the facts. How to assimilate the facts and make them our own.

We sometimes hear an illiterate person say something like this: "I learned him a lesson." Now this is not only bad grammar but it states an impossibility. A teacher cannot learn for the student. The student must do all the learning himself. A good teacher is very helpful. He presents the things to be learned in an orderly and systematic manner and he guides the mind of the student into the best way of making the new knowledge his own. But the student does all the learning. Therefore, educating one's self is more difficult than being educated in a regular school, but the results are the same.

Abraham Lincoln is often cited as the shining example of a self-educated man. However, we believe that if Abraham Lincoln were a young man today he would work his way through college rather than study a few books by the light of shavings tossed into the fireplace.

Education in telephony begins when a man goes to work in any capacity in the industry. He will receive practical experience as a matter of course. He will learn from the experience of those who have gone before him, but will he

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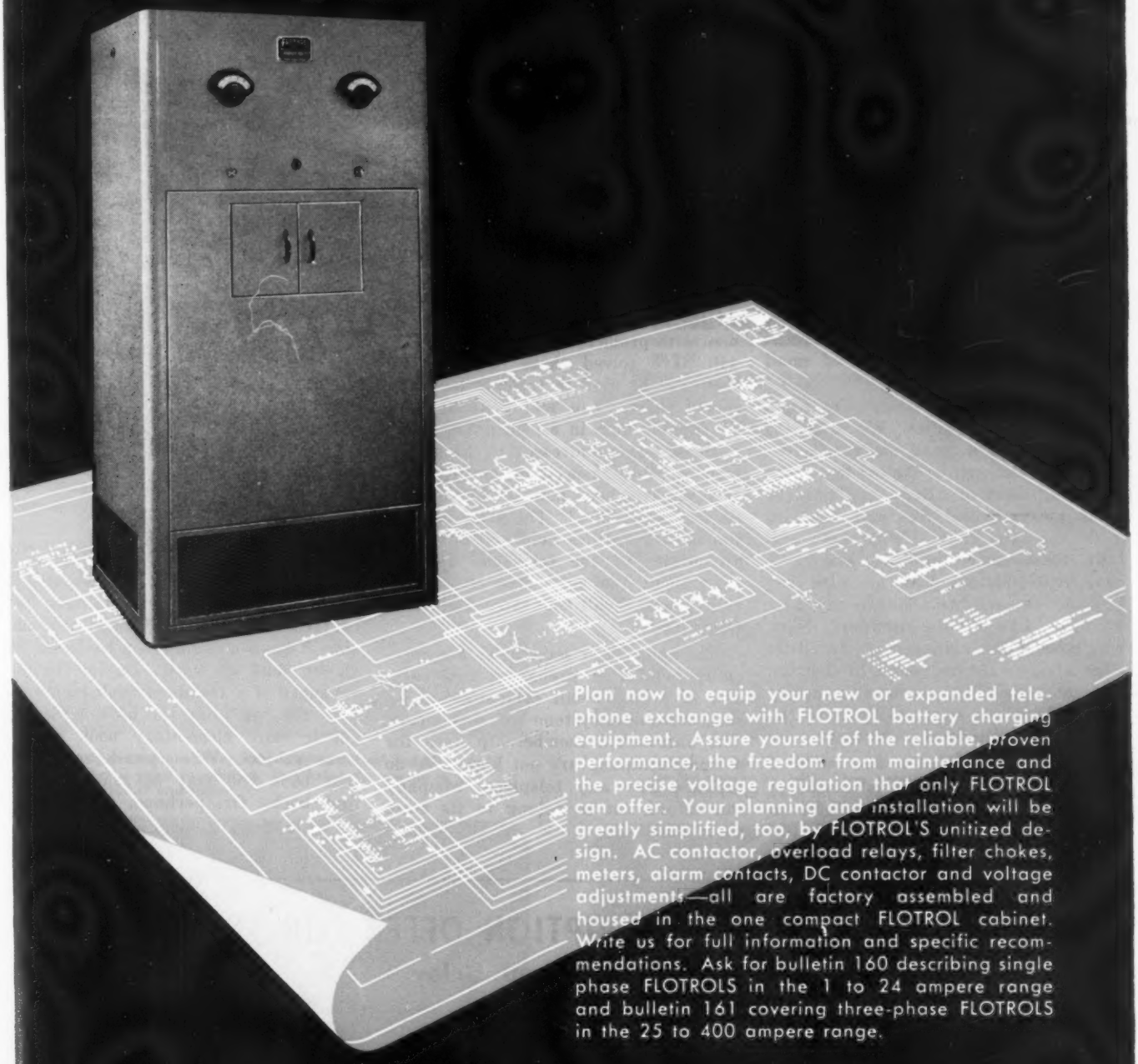

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learn from his contemporaries? An inventor would not waste his time trying to invent something that had already been invented and was in common use. He would first learn what had already been done along that line. He would then be in a position to invent an improvement. A telephone man should not spend months trying out an idea without first finding out what his colleagues have done along that line. Have they tried the same thing that he is trying? Was it a success or was it a failure?

Large telephone companies see that each of their men receives as much education as he can absorb and make use of. Each job is taught in a school, and there are schools that teach the higher technical subjects.

The smaller companies do not have the facilities to conduct training courses for their employes, but there are ways in which they can see that their employes' and managers' knowledge of the telephone business is widened. Let's look at a few of these ways (and these comments are directed to the owners and managers of small companies):

(1) *Visits to other companies*, especially larger companies. We talked to an operator at a small magneto office. She was anxious to know what the operating room at "Big City," only 40 miles away, looked like and how did it do this and that. "Why don't you visit them sometime," we asked. "I have little time off. I am not sure that I would be welcome. Maybe my boss would not like it," she answered. Now, why doesn't the manager of that little office arrange for his people to visit the office at "Big City," even on company time? When we suggested this to the manager *we found that he had never been there himself.*

The telephone business is unique in that all companies can be helpful to each other without fear of disclosing any trade secrets. A retail merchant, for example, cannot visit the store of a rival to learn how he runs his business. (He sometimes sends a "shopper" for that purpose.) But a telephone man is welcome in any telephone office. In these days of heavy toll usage the service at any exchange is affected by the service at all other exchanges with which it exchanges toll calls. The big company is especially interested in seeing that good service is rendered by the small exchanges in his vicinity. And it is not a one-way interest. A big company man often learns some simple, but eye-opening fact, in visiting a small company.

This relationship can go beyond friendly visits. Small companies can often arrange with a larger company for "on the job training" of some of their people or can arrange to have their people included in some of the special training classes of the large companies.

(2) *Join your telephone association.* At the state conventions you will meet men with problems like your own. Some will have solved these problems and they will be glad to tell you how they solved them. You will hear speeches by capable men in all branches of the business; also addresses by prominent men in other lines of endeavor, which help the telephone man to "see himself as others see him." The state association also furnishes help and advice on all phases of the telephone business throughout the year through its secretary and Small Company Assistance Committee.

The association secretaries are especially helpful in preparing rate cases and in aiding small companies to install adequate systems of accounting. The association membership dues for a small company are not high. We do not see how any telephone company can afford not to belong to its state association.

(3) *Extension courses and night classes.* If an exchange is located near a college or university, courses may be available in such subjects as mathematics, science, foremanship and business management. At one time, the writer was manager of a plant located 15 miles from one of the Kansas State Teachers Colleges. All telephone people within driving distance were offered a course in mathematics and electricity. This school had an excellent electrical laboratory.

In the larger cities the chambers of commerce often arrange courses in accounting, foremanship, and business management for the benefit of all local industries.

(4) *Correspondence courses.* These should be examined very carefully. There are a few reliable correspondence schools and many that are outright fakes. Many people find that this is a most difficult form of education and cannot complete the course. However, these schools commonly demand payment for the complete course even though the course is abandoned within a short time. Schools which demand this kind of a contract should be left alone. Also the high pressure salesmen which some of these schools employ should be disregarded. Nevertheless many men have obtained a good education by way of a correspondence course.

(5) *Text books.* Many excellent books are available on various phases of telephone work (Trade journals have lists of these books). Every telephone man should have a number of books on his chosen field of work. Do not be discouraged if a technical book seems too deep for you. Lay the book aside and get a more elementary book on the same subject. When you have studied that book you may be ready for the first book. Or, perhaps, you need to

(Please turn to page 74)

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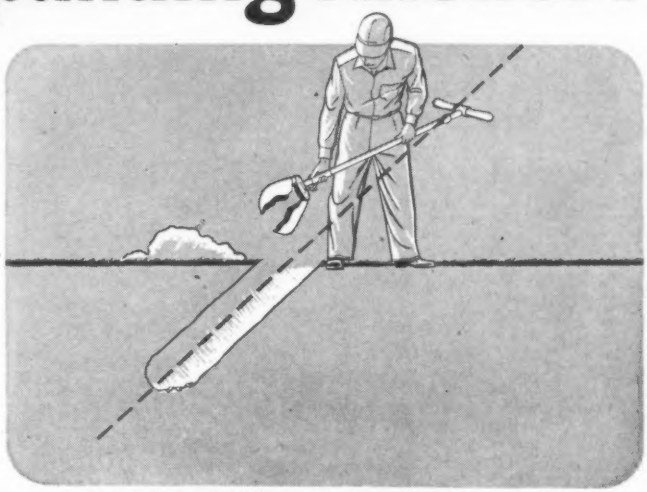
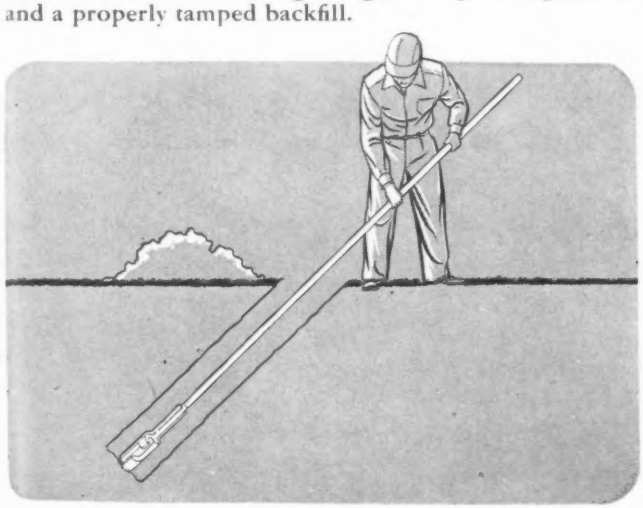
Expanding anchors may be used in any type of soil with the exception of hard rock, shale, extreme hardpan and, of course, swamps and marshes.

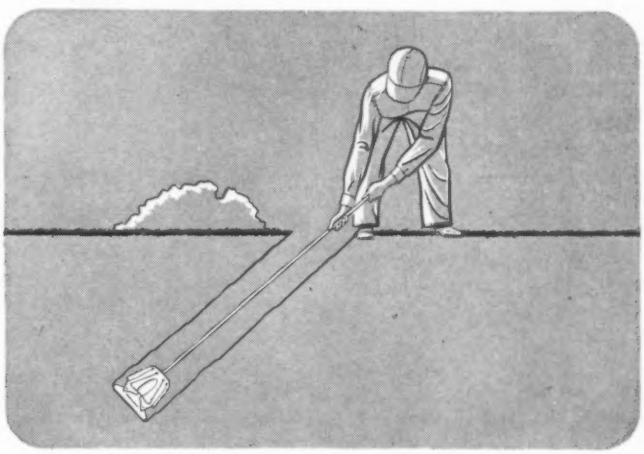
Merely dropping the anchor in the hole, throwing in the dirt, and piling it up in a little mound to allow for settling, is the easy—but ineffective way! An anchor so installed will not develop its rated holding power. The successful formula for a good expanding anchor installation is the correct sized hole at the right angle, complete expansion, and a properly tamped backfill.



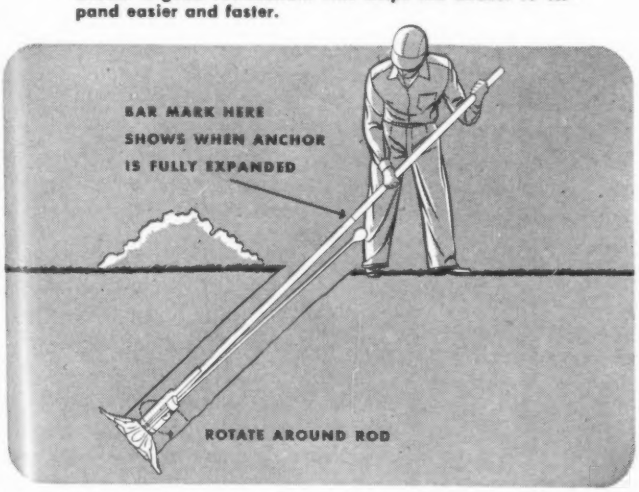
1. Bore hole in direct line with guy attachment, whenever practical. This prevents gradual slacking of the guy. Hole should be same diameter as anchor for greatest holding power.



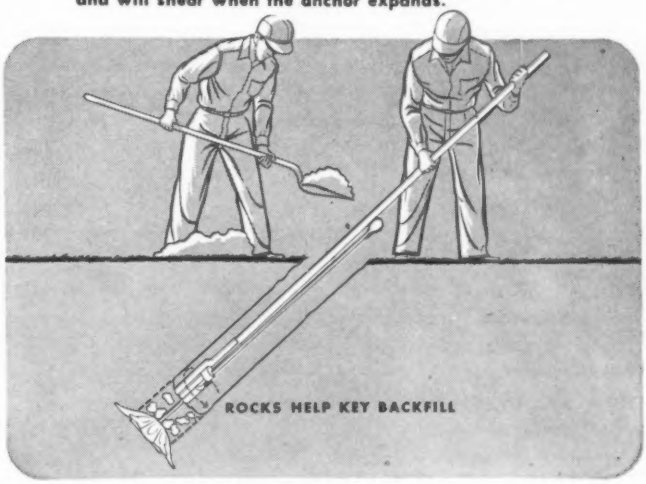
2. Tamp the bottom of the hole to square it off and give the anchor a good foundation. This helps the anchor to expand easier and faster.



3. Attach anchor to rod and push to bottom of the hole. *Do Not remove tie wires.* They help in placing the anchor and will shear when the anchor expands.

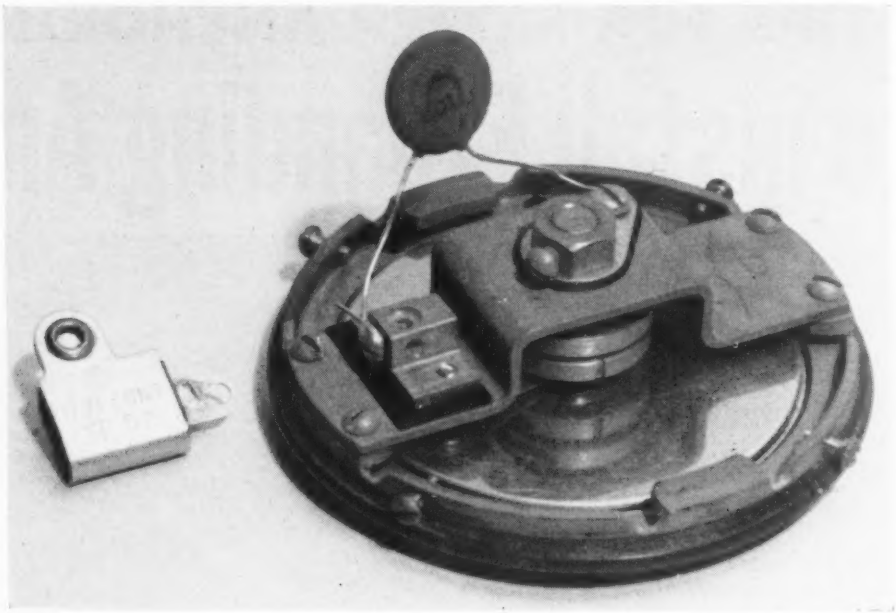


4. Expand the anchor with an expanding and tamping bar that hooks around the rod. Be sure that the anchor expands fully. A mark on the expanding bar will help.



5. Tamp backfill thoroughly with expanding bar hooked around anchor rod. Rotate bar during tamping to pack entire area. Use driest dirt for first 2 feet of fill.

Reprints of this advertisement for your bulletin board, or for distribution to your men, are yours for the asking—request Form 23, Expanding Anchors. Write A. B. Chance Company, Centralia, Mo.



Radio interference suppression equipment used on transmitters. A Western Electric 323BW type transmitter is shown equipped with a radio-type condenser. Next to it is a telephone-type condenser used for mounting beneath a handset transmitter. Photo by Richard Hartwig.

RADIO INTERFERENCE on Subscriber Lines

By HAROLD McKAY

ONE OF THE more annoying types of trouble which telephone companies can experience is the interference on subscriber lines caused by nearby radio transmitters. This trouble usually results in the telephone subscriber hearing the radio station's broadcast on his telephone as cross-talk. In severe cases the radio signal may even cause arcing at the protector blocks, with consequent noise.

This type of interference may come from any kind of a radio station—broadcast, police, government, amateur, etc. Fortunately most high power broadcast and overseas stations are usually located outside of densely populated areas, so that little interference is caused by them. In addition, commercial stations are usually of good engineering design and radiate very little spurious emissions of the type that might cause interference to other services.

Amateur stations, however, may cause considerable trouble, largely because of the fact that they are usually located in residential areas, where there are a large number of telephones. Also, the amateurs use different frequencies in their work, which can give rise to interference conditions which will be discussed later. Government and overseas stations, which also use different frequencies, can likewise cause trouble because of this fact.

To correct the interference condition, preventive measures must be taken at the radio station, in the telephone plant, or both. An understanding of the reasons for this trouble is helpful in eliminating it, and it should be understood that the corrective measures discussed below apply primarily to subscriber lines, and will not ordinarily be effective on carrier circuits.

Corrective Measures on the Telephone Line. A radio signal, in order to be heard must be "detected" or rectified. While a telephone circuit is not purposely equipped with such a detector, some items of the plant may accidently function as a rectifier, and receive the radio signal.

The telephone transmitter, with its loose carbon grains, can act as a detector for radio signals. In fact, one of the earliest detectors made for radio was a device called the coherer, which consisted of a container filled with metallic grains.

Any other item of the plant which contains a loose connection can act in a similar manner. Any point where a copper wire is fastened under a binding post can become a rectifier, if corrosion or oxide exists. Copper oxide makes an excellent rectifier. Battery chargers frequently employ this chemical for their rectifying action.

Copper oxide can exist under a binding post in a subset, terminal or protector, and particularly in a loose splice in any wiring, inside or out. The obvious remedy for this condition, then, is to clean all connections.

Radio interference can often be eliminated merely by cleaning the crop

(Please turn to page 52)

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Strowger Automatic is the only automatic switching equipment which has been in service *long enough* to establish records of simple, low-cost maintenance which are *beyond question.* Ask the owner of a Strowger Automatic exchange to tell you frankly about maintenance. Get the facts and figures—and you'll buy Strowger Automatic!

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wire where it connects to the terminal binding posts to remove all traces of copper oxide.

Filters

If the trouble is being caused by rectification in the transmitter unit, different methods must be used. The older type transmitters found on desk and wall sets are the worst offenders, as some later model handsets have a filter condenser built into them.

A filter condenser works on the principle that a condenser will pass a greater current at high frequencies than it will at low frequencies. Therefore, it is possible to place a condenser across the transmitter which will bypass the radio signal and prevent it from reaching the transmitter. A condenser of about .005 microfarads will practically short-circuit the radio signal, but will not affect the lower voice frequencies. Condensers are available from manufacturers of telephone instruments.

In addition, older type sets should be connected for anti-side tone if possible. In some cases the side tone reduction hook-up may clear the trouble without the use of a condenser.

Condensers may also be required at the protector in stubborn cases. This is especially true for the telephone which is on the premises where the radio station is located. A larger condenser is used in this application, usually about .1 microfarad in size. A condenser of this type should be connected from each line wire to ground, on the station side of the protector. These condensers should have a voltage rating high enough to stand any expected line surges. A 1000-volt rating is recommended, but 600-volt types are more easily obtainable.

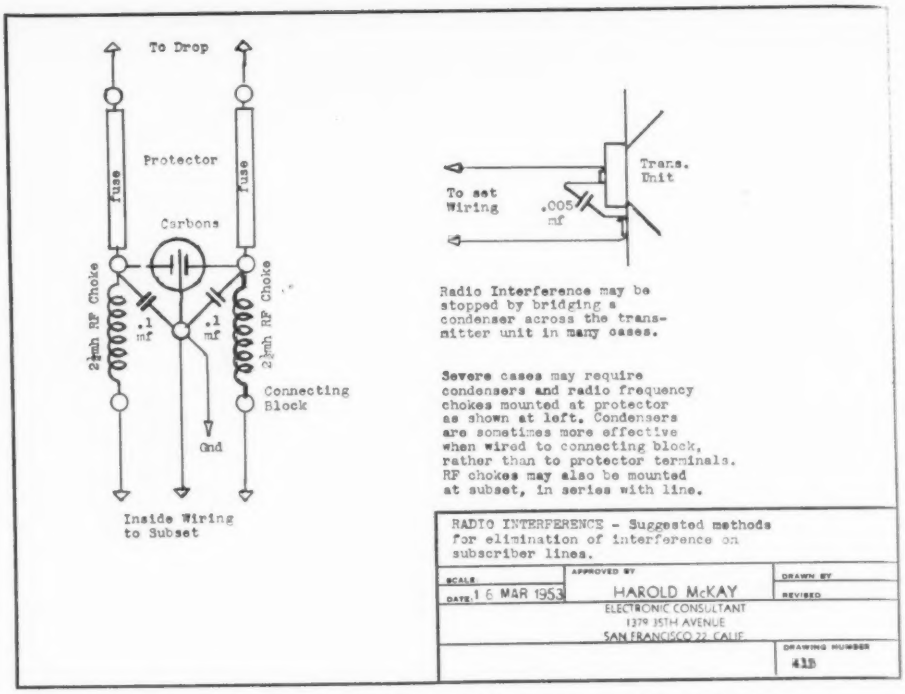
Further, the two condensers should be matched. That is, they should be as nearly identical in capacity as possible. Most radio dealers will test several condensers for a customer, and supply a matched set.

Choke Coils

The use of choke coils is often effective when condensers do not eliminate the interference. Radio frequency chokes of about 2½ millihenries in size are effective for interference at wave-lengths in the broadcast range.

These chokes may be connected in series with the line, either at the subset, or the protector, as determined by experiment. At the protector, they may function better if placed behind the condensers, rather than ahead of them. In selecting chokes for this purpose, due consideration should be given to the resistance of the type chosen, in order not to introduce excessive losses into the telephone line.

(Please turn to page 81)


To Drop
Protector
fuse
fuse
Carbons
2½mh RF Choke
.1 mf
.1 mf
2½mh RF Choke
Connecting Block
Gnd
Inside Wiring to Subset
To set Wiring
.005 mf
Trans. Unit
Radio Interference may be stopped by bridging a condenser across the transmitter unit in many cases.
Severe cases may require condensers and radio frequency chokes mounted at protector as shown at left. Condensers are sometimes more effective when wired to connecting block, rather than to protector terminals. RF chokes may also be mounted at subset, in series with line.
RADIO INTERFERENCE - Suggested methods for elimination of interference on subscriber lines.
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DRAWN BY
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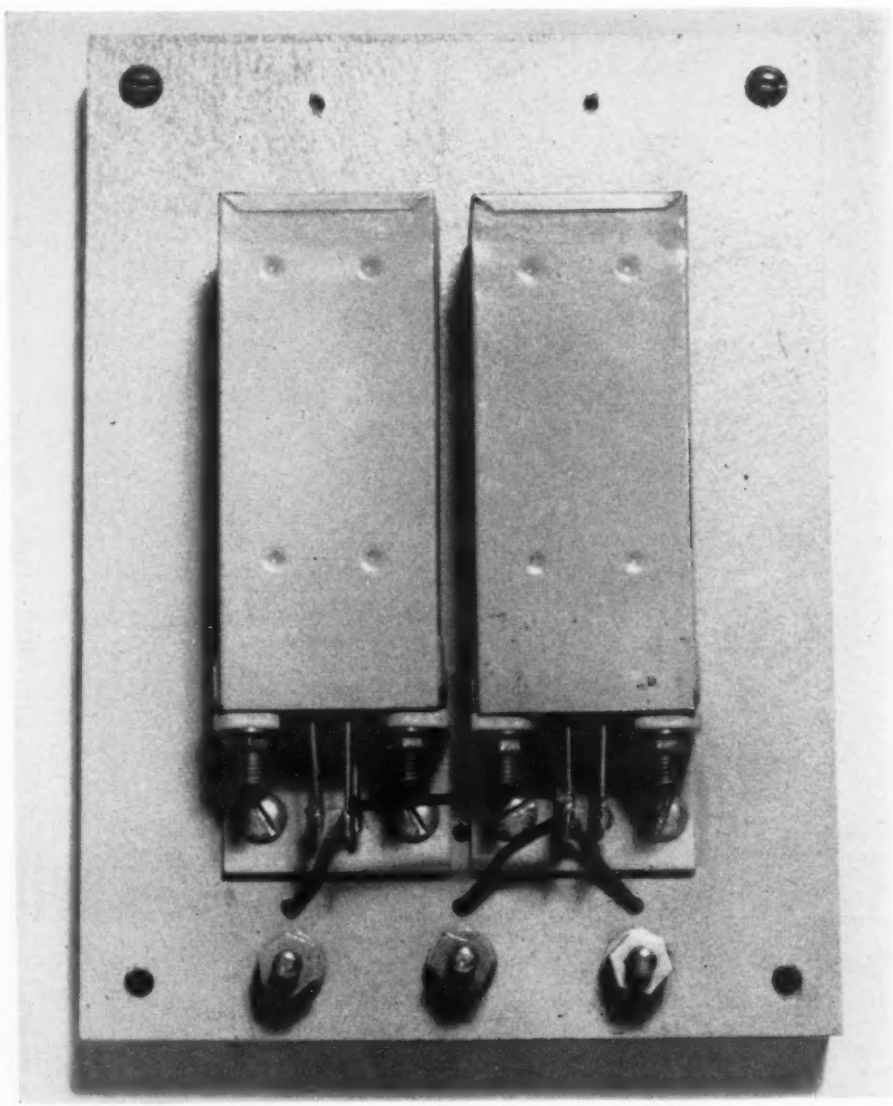
Suggested method for elimination of interference on subscriber lines.



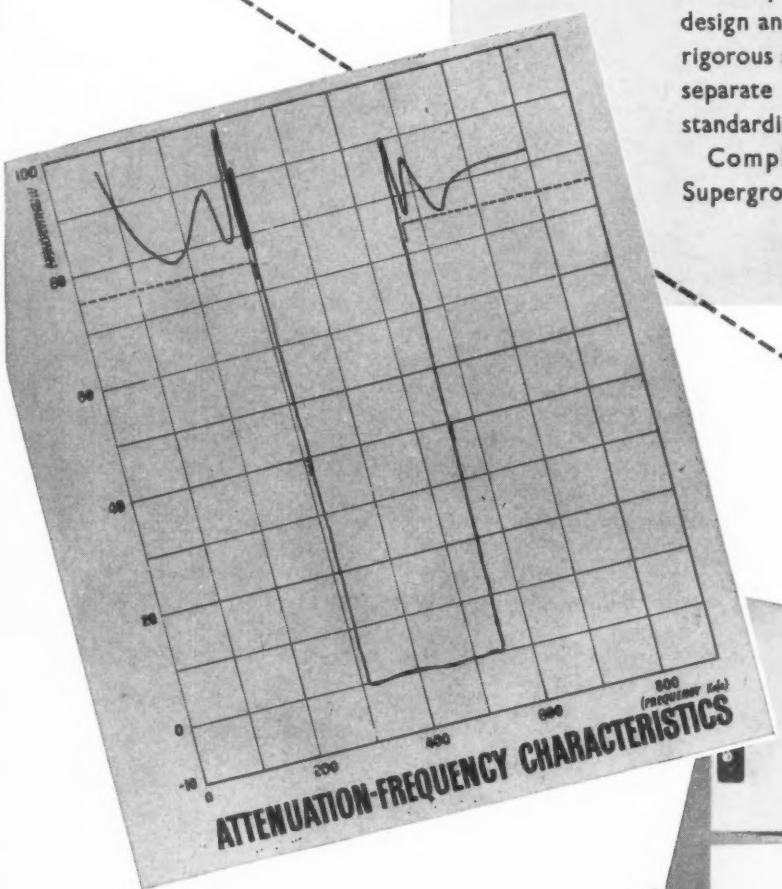
Condenser assembly for mounting near telephone protector. This is a standard telephone item, but radio parts may also be used. Photo by Richard Hartwig.

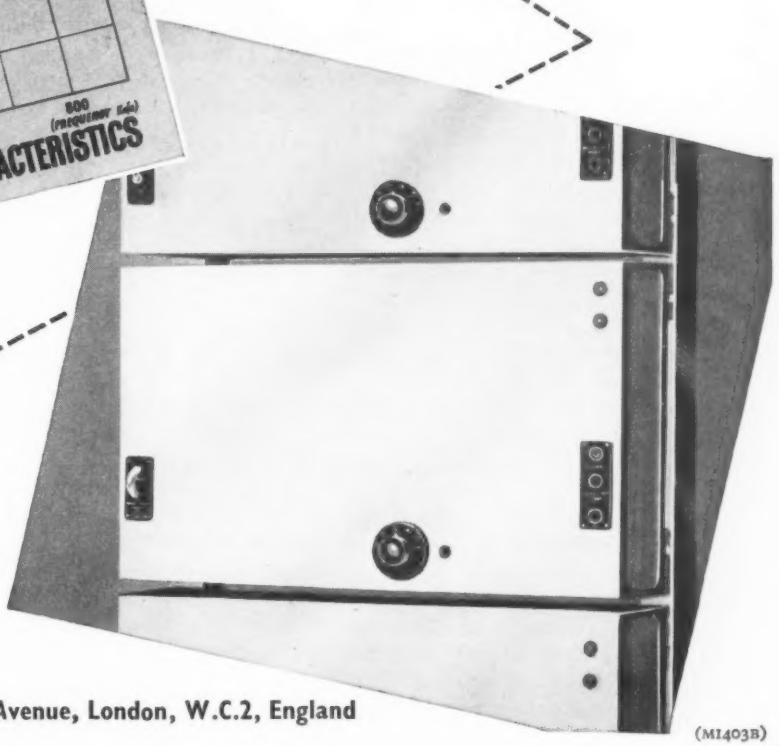
A compact through-supergroup filter

DESIGNED FOR QUANTITY PRODUCTION

THE Mullard Through-Supergroup Filter, GTF.100, is designed for manufacture by normal quantity production methods. Conventional condensers and coils with Ferroxcube cores are used throughout. As a result, it is available at a comparatively low price. The necessary amplifiers have been incorporated in the design, so that the Filter is complete on a single 19-inch panel which is only 12¼ inches high. In both design and performance the GTF.100 fully meets the rigorous specifications necessary for filters that must separate supergroups in the frequency allocation standardised by the C.C.I.F.

Complete details of the Mullard Through-Supergroup Filter are available on request.





Mullard

Trade Mark Mullard Ltd.

Mullard Overseas Ltd., Century House, Shaftesbury Avenue, London, W.C.2, England

(MI403B)

During the Iowa convention six past presidents of the Iowa association were presented with certificates in recognition of their service to the association. They are pictured above, left to right: L. F. MORRISON, Grinnell; H. B. MELICK, West Liberty, who also was elected an honorary life-member of the board of directors in recognition of his many years of service to the association; W. H. FOWLER, Pella; C. A. FARRINGTON, Centerville; CLYDE McFARLIN, Montezuma, and E. G. BELLAMY, Knoxville.

Iowa Service Seen Model for Japan

By H. D. FARGO JR.

ON MAR. 18, 1896, a group of telephone men met in Des Moines and formed the Iowa Independent Telephone Association. On Apr. 7 and 8 the 57th convention was held in the same town, with an attendance of over 700.

President C. C. Pearce, Riceville, in his address, read a letter from Howard F. Van Zandt, telling of the latter's appearance before the Japanese Diet (parliament) in December of last year. Mr. Van Zandt, now assistant sales manager of Kellogg Switchboard & Supply Co., spent five years in Japan helping with the rebuilding of the telephone system there. In answer to a question by a member of the diet who asked what state would be a good example for Japan to study, Mr. Van Zandt stated:

"The state of Iowa is well known in the United States for the excellence of the telephone service being given. There is no regulating body in Iowa to control rates and service. Yet there are no states where the service is better and where rates are lower."

President Pearce commended the splendid work of the 10 committees operating successfully in the association, referring particularly to those in charge of small companies, toll compensation, tariff, traffic, legislation and plant. He quoted from an editorial headed, "Is Old-Style Utility Regulation Best?" which was published in an Iowa newspaper and which concluded:

"It is no accident that the least-regulated public utility—the telephone system—has been the most progressive and imaginative of the utilities group."

Mr. Pearce compared the cost of top-quality telephone service with such items as cigarettes, liquor, movies, gasoline, cosmetics, etc.—all costing as much or more than good telephone service. At recent district meetings, he said, Mr. Langer of the Iowa Farm Bureau declared that good telephone service at $5.00 a month might be well worth the price, but also that 50 cents a month would be considered high if the service were poor.

Defeat of a movement to establish a state utility commission in Iowa was covered by Clyde McFarlin, Montezuma, general counsel of the association. It was fast work, he said, in introducing the bill—but also fast work in mustering opposition—and it never came to a vote. Some of the electric companies favored the bill at first, he said, but withdrew their support when shown a map depicting 754 Independent telephone exchanges. "Those 754 dots on the map make a big impresion," Mr. McFarlin said, "and bring a quick realization of the large number of people represented."

Mr. McFarlin gave many other examples of how the counsel's office aids member companies. He concluded his remarks with a warning that a business recession may not be far away.

"Who's the Boss?" was the subject of an address by C. L. Sampson, Omaha, Neb., vice president and general manager, Northwestern Bell Telephone Co., who first pointed out how different the telephone business (furnishing service) is, from businesses that furnish a product. One is intangible and cannot be stocked—whereas the other can be measured, tasted, sampled, etc., and if found faulty, it can be left alone. If telephone service is of poor quality, the customer has no choice but to deal with a"monopoly." Thus, it is of paramount importance to give good service—and to seek good public relations.

Mr. Sampson listed ways the telephone business needs and asks for public cooperation. He then catalogued things that will influence good public relations:

"All service—Prompt, adequate, accurate, of good quality, courteous, friendly, convenient."

"Rates—Fair and reasonable."

"Employes—Selection—will like us if they like our employes; conduct on and off job, neatness, workmanship, safety, consideration for others, union-management relations."

"Plant—Location, appearance, motor vehicle—operation and appearance."

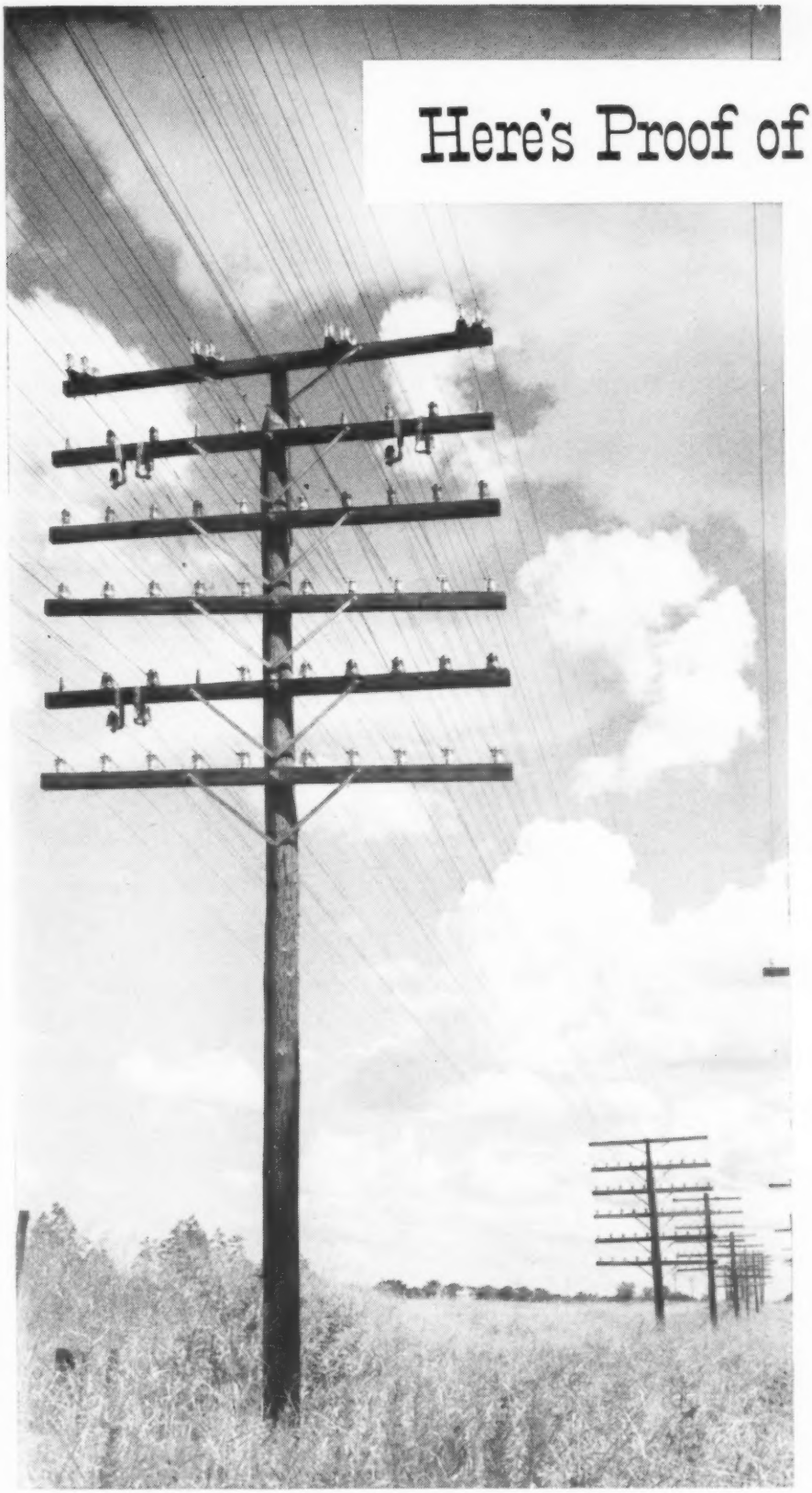
"Directory—Accurate, readable."

"Bills—Accurate, understandable."

"Collection Practices—Fair and reasonable."

"Research and Development—Modern and improving service; finding economies."

"Financial standing—Stable and adequate for all requirements."



Here's Proof of Performance...

Southwestern Bell has had 40 years of service from these pressure-creosoted poles

● In 1912, Southwestern Bell Telephone Company erected these poles to carry a toll line from Dallas to Ennis, Tex., as one link in a through route from Houston to Dallas. A total of 1240 poles were erected in the 31-mile section and each was pressure-treated with Creosote Oil at 6 pounds retention.

Today—40 years later—more than 42% of the original poles are still in service. Most of the replacements took place in 1948 when the line was given a major overhaul. The poles left in place at that time were sound, showed no signs of rot or splitting, and appeared good for 5 to 10 years of additional life.

When you use a wood preservative, let service records like this be your guide. They are another good reason why users of preserved wood make Creosote Oil their first choice.

Creosote Oil contains not one but many compounds whose toxicity and permanence ward off attack by such wood destroyers as termites, fungi, dry rot and marine borers.

When you use treated wood, be sure it is pressure-creosoted with U·S·S Creosote Oil. It is the product of continuous processing in the world's biggest tar distillation plant. For complete information, contact our nearest Coal Chemical sales office or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

THESE PRESSURE-CREOSOTED POLES, owned by Southwestern Bell and located near Highway 75 between Dallas and Houston, Tex., have been in service since 1912.

U·S·S CREOSOTE OIL

13

UNITED STATES STEEL

Officers of the Iowa association standing beside huge replica of a telephone handset in the lobby of the Fort Des Moines Hotel during the Iowa Convention are, left to right: President C. C. PEARCE, Riceville; Secretary W. F. MILLER, Des Moines; First Vice President E. G. CARLSON, Creston, and Second Vice President ROSS VERNON, Sioux Center.

Calling attention to the fact that it isn't enough to do a good job, the speaker said, "We must also tell about it. The need for telling might be illustrated in the following examples.

"Take a look at a telephone set. It is the most common thing that a customer sees about telephone plant. Station equipment represents only about 6 per cent of the investment in plant. The customer dials a number—it is easy, nothing to it. We know better. We know that behind it is the largest and most complicated machine ever invented by man. But the customer doesn't realize this until we tell or show it to him."

He also listed and showed the vacuum tube, a section of coaxial cable and the transistor. Mr. Sampson concluded his very interesting talk with these remarks:

"In the beginning we posed the question "Who's the Boss?" of the telephone business. Have we answered it? Let's see.

"Who grants us the right to be in business? Who permits us to build our plant on their property? Who subscribes for our service and pays our bills? Who demands good service and stirs up trouble for us if we don't? Who gives us rates that permit a fair return on our investment?

"Who's the Boss? The public, of course.

"It is wisdom to take good care of the boss."

The subject of developments on a national level was ably discussed by Edwin M. Blakeslee, president of the United States Independent Telephone Association, in his address, "Washington Reporter," in which he emphasized the importance of the national association's office in attending to many legislative measures. Mr. Blakeslee told of the timely action by USITA Executive Vice President Clyde S. Bailey in assuring protection of the telephone industry's interests in stand-by control legislation. He reviewed all pending bills, summarized the recent toll compensation revision and ended with a statement that the Telephone Advertising Institute is an excellent means of gaining satisfactory public relations.

At a luncheon meeting Clyde McFarlin introduced Allan B. Kline, president, American Farm Bureau Federation, who gave a highly inspired address on "We Are All in This Together." He stressed the need of retaining world trade and said it is most important that the export of farm products continue. He urged the elimination of "that defeatist attitude—that a peace economy means depression." He said we must cultivate confidence that our country can surmount all problems.

"Growth should be paid for out of new capital brought into the business," stated R. W. Smith, president and editor, Telephone Engineer & Management, in an address on "Good Plant, Good Service, Good Rates."

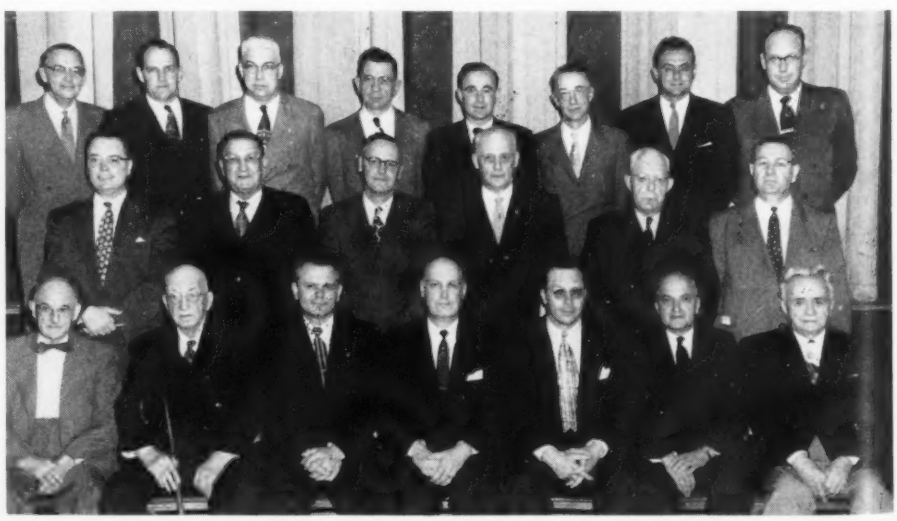
"The best way to assure the company plenty of new capital," he continued, "is to pay liberal dividends, thereby making it easier to sell additional stock and at a good price."

Mr. Smith added: "It is a natural assumption that the unprecedented demand for telephone service, existing since the end of World War II, will at some time level off to a more normal rate.

"A question of profound importance to the telephone industry, which must supply the money, manpower and materials for meeting the demand for telephone service is, when will this heavy demand level off, and what will the level be then?"

An informal, yet very instructive and entertaining discussion of the value of adequate accounting methods, was given by A. G. Kiesling, C.P.A., Madison, Wis.

From his store of experiences in deal-



Officers and directors of the Iowa association. First row, left to right: H. B. MELICK, West Liberty (honorary life director); C. A. FARRINGTON, Centerville; E. G. CARLSON, Creston; C. C. PEARCE, Riceville; ROSS VERNON, Sioux Center; CLYDE McFARLIN, Montezuma, and W. H. FOWLER, Pella. Second row, left to right: W. F. MILLER, Des Moines; J. A. SCHUTTLOFFEL, Walnut; H. C. AMICK, Des Moines; L. F. MORRISON, Grinnell; FRANK GORDON, Fort Dodge; R. E. BRANDEL, Mt. Pleasant. Back row, left to right: V. B. CLARK, Lincoln, Neb.; J. J. McINTOSH, Cedar Rapids; HAROLD THOMPSON, Clear Lake; E. B. ZERWAS, Manning; H. F. MELICK, West Liberty; V. D. PECK, Primghar; E. G. BELLAMY, Knoxville, and A. W. SANDERS, New London. Not in photo—Directors A. L. KELLEY, Clarinda, and F. G. PYLE, Newton.

THEY'RE SURE TO KEEP IT CLEAN BECAUSE IT ENCOURAGES CLEANLINESS

SHERRON

OUTDOOR BOOTH

made of

STEEL AND WIREGLASS

MODEL 17 S — TYPE 1

there's a
Sherron Booth
for every location!

No warning signs are needed to persuade folks to keep the Sherron outdoor booth clean. They just do. They feel the same responsibility that they do in any sanitary atmosphere. It is easy to understand why.

Constructed of steel and wireglass, the Sherron booth won't rot or decay. It won't deteriorate and become seamy and unsightly. Besides, being fireproof, it isn't subject to ugly charring and scorching.

The trim good looks of the Sherron booth's clean, classic lines are there to stay — for good . . . with a minimum of maintenance.

SEE COMPLETE SHERRON LINE IN TELEPHONY DIRECTORY AND TELEPHONE ENGINEER & MANAGEMENT DIRECTORY

SEE OUR SPECIFICATIONS SWEET'S

SHERRON METALLIC CORPORATION

1201 FLUSHING AVENUE • BROOKLYN 37, NEW YORK

HIGHWAY HD EARTH BORING MACHINE

Digs holes 9" to 20" in diameter, 7' to 10' deep.

Sets poles 40' to 45' in length 2000 to 2500 pounds in weight

IN ANY SOIL . . .

The famous Highway Model HD Earth Boring Machine digs holes quickly and easily in any soil. Light enough for mounting on one and one-half ton truck. Or, can also be mounted on a tractor. Requires only six feet of platform space. Operates from truck platform where operator has clear vision. Quickly adjusted to dig at any angle. Single drive from engine furnishes all power.

A 2500-pound capacity winch and a pole derrick to handle 40-foot to 45-foot poles can be furnished with the Model HD as optional equipment. No separate drive from engine is needed for operation of their accessories.

Also available are the Model HC Earth Boring Machine for extra-heavy duty work and the Model P. E. Digger, an economical, completely portable machine for the occasional user.

Send today for your complete Highway Public Utility Equipment catalog. Or, for quick, first-hand information, call or visit the friendly Highway Distributor or Factory Branch nearest you.

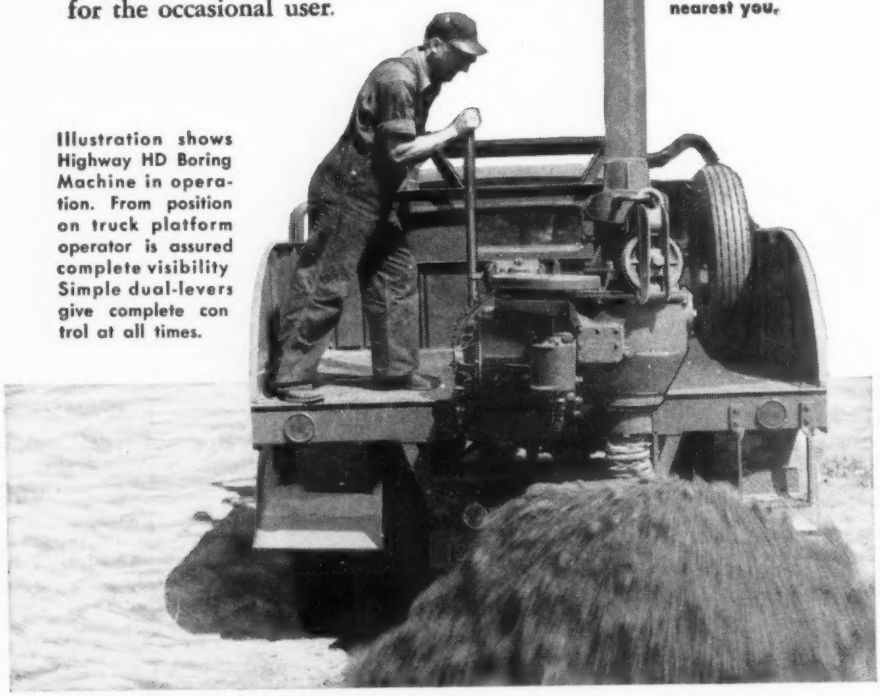


Illustration shows Highway HD Boring Machine in operation. From position on truck platform operator is assured complete visibility Simple dual-levers give complete control at all times.

HIGHWAY TRAILER COMPANY

Headquarters: Edgerton, Wisconsin

PLANTS AT EDGERTON, WISCONSIN—STOUGHTON, WISCONSIN

The nation's largest manufacturer of Utility Truck Bodies • Earth Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-offs • Service Accessories

ing with small telephone companies. Mr. Kiesling gave examples of the really pathetic lack of even simple bookkeeping. The books of one company showed a net of $298 on a plant investment of $60,000. It seems there exists a faulty tendency, which is quite common, to build up surplus throughout the years, instead of paying out more return to stockholders in the form of dividends.

Tracing the association's progress over the years, William F. Miller, in his secretary-treasurer's report, recalled that in only three years the mailing of *The Transmitter*, the association's monthly news bulletin, increased from 1,000 to 3,000. Also, whereas in 1950 there was a dearth of material to print, even on such matters as metalicizing or rate increases, now it is difficult to find space sufficient to cover dial conversions. He said the rate of dial conversions had averaged about one per month since 1946—"Within the next two years, we shall see an average of a little better than two per month."

Mr. Miller then summarized the various booklets made available to member companies by the association, for example the one entitled: "Steps in Securing a Telephone Franchise."

"Between its covers," he said, "you are given the distillate of much experience and many, many hours of legal research work. A word of caution about it however, don't try to get a franchise without engaging a local attorney. The booklet will be extremely valuable to him—will save him time and you, money."

Arthur C. Kelley, Clarinda, chairman of the association's Plant Committee, reported on the plant conference (Chief Instructor: Ray E. Elliott, Assistant Plant Employment Supervisor, Northwestern Bell Telephone Co.) and on the plan for a plant school at Ames College. Enrollment has been gratifying; it is expected to last a week and consist of 20 hours of laboratory work and 20 hours of classroom work. Cost is not to exceed $65, board and room included. He continued, "It will be based on the fundamentals of electricity as applied to the telephone industry. Both theory and practical application of the theory will be given and your committee feels that any telephone company sending a student to this school will profit three-fold by so doing.

"If this one week of school is as large a success as those of us who are working with it feel it should be, the same course may be given next year for those who couldn't attend this first session. Also, it is being planned that a one week's school of an advanced

(Please turn to page 70)

Better Lines By "FOLEY"

TELEPHONE
Design · Surveys

OPEN WIRE • TOLL • SUBSCRIBERS LINES

AERIAL AND UNDERGROUND CABLE CONSTRUCTION
CONDUIT AND MANHOLE SYSTEMS

CONSTRUCTION • MAINTENANCE • REBUILDING
CABLE SPLICING AND TESTING

COMPLETE SUPPLY OF POLES, ARMS, HARDWARE, ON HAND AT ALL TIMES

Electric Transmission • Distribution

Light and Power Systems

Design • Surveys • Layout • Planning

Transmission and Distribution Line Construction and Maintenance

Street Lighting Systems • Power Distribution

Substation Construction • Steel and Wood

Steel Tower • Foundations and Erection

Complete Supply of Poles • Arms • Insulators • Guying and Line Hardware on hand at all times

Large Stocks of Poles for Barn Construction

ROBERT E. FOLEY CONSTRUCTION CORPORATION

48 GRISWOLD STREET TELEPHONE 2-7215 BINGHAMTON, NEW YORK

COURTS AND COMMISSIONS

Illinois Bell Granted $16,518,000 Rate Raise

Rate increases totaling $16,518,000 were granted on Apr. 15 to the Illinois Bell Telephone Co. by the Illinois Commerce Commission (TELEPHONY, Apr. 11, p. 42). Illinois Bell said the new rates were to be effective on April 16.

The company had been seeking an increase of $22,800,000 since Jan. 12, 1951. It was first denied in December, 1951. The commission's decision was then taken into court by Illinois Bell. The Illinois Supreme Court, upholding the Kane County Circuit Court, ruled the commission erred on several points in denying the company a rate increase and ordered a rehearing of the case.

Illinois Bell then took the position that the supreme court's ruling automatically authorized the increase without further action by the commission, and on Mar. 31 placed in effect the 22.8-million-dollar rate increase.

The commission on Mar. 31 said that its attorneys would go into the Kane County court on Apr. 2 with a petition for an injunction to restrain the company from collecting the increased rates pending further hearings before the commission.

The further hearings resulted in the $16,518,000 rate increase approved by the commission.

William V. Kahler, president of Illinois Bell, termed the new rate schedule "extremely disappointing" and said such "prolonged delay" in granting new rates "is a sure route to poor telephone service."

Mr. Kahler said the company would study the order for future action.

V V

O.K. Excess Mileage Schedule For Nebraska Independent

The Benkelman Telephone Co. was given authority to establish excess mileage rates outside its base rate area in an order by the Nebraska Railway Commission on Apr. 3.

Demand by the public for business and residence service outside the base rate area, which is the corporate limits of Benkelman, prompted the filing of the application.

The commission established the following monthly excess mileage charges for each ⅛ mile or fraction thereof:

One-party	35 cents
Two-party	25 cents
Four-party	20 cents

Excess mileage charges are computed on airline measurements from the closest point on the boundary of the base rate area to the subscriber's telephone.

V V

Ohio Independent Applies For Rate Increase

The Citizens Telephone Co. of Coolville applied to the Ohio Public Utilities Commission for an increase in rates on Apr. 13.

The company said that present rates do not give it a fair return on its investment.

V V

Illinois Independents Make Rate Raise and Sale Pleas

The Illinois Commerce Commission's April docket scheduled the following hearings:

On Apr. 22, the application of the Dorchester Telephone Co. for a proposed advance in rates.

On Apr. 23, the application of the Schuline Telephone Co. for approval to

GENERAL CABLE

Now—STRONGER

No. 18

Neotel

DROP WIRE

Costs Less-Lasts Longer

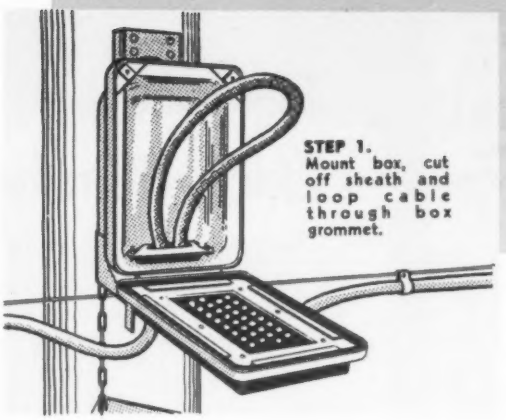
The No. 18 Copperweld conductors of this Neotel Drop Wire provide 20% greater strength than No. 17 of other types—at a lower cost! Their 400-lb. breaking point enables them to bear heavier ice loading—to take all kinds of punishment longer without maintenance. Neotel's tough Neoprene jacket resists weather and wear, sun and oil. Field-tested, proved. Write or call our nearest warehouse for prices on No. 18 Neotel Parallel Drop Wire today! It costs you less now, less in the long run.

Made by General Cable for

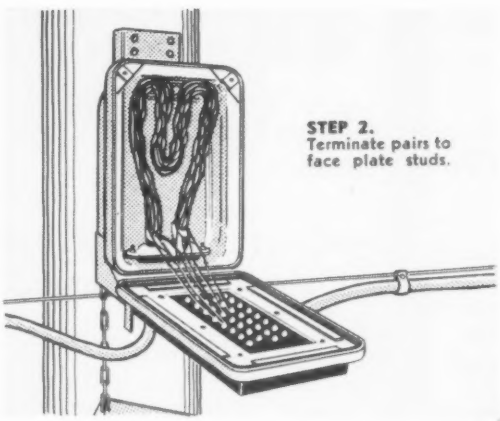
AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

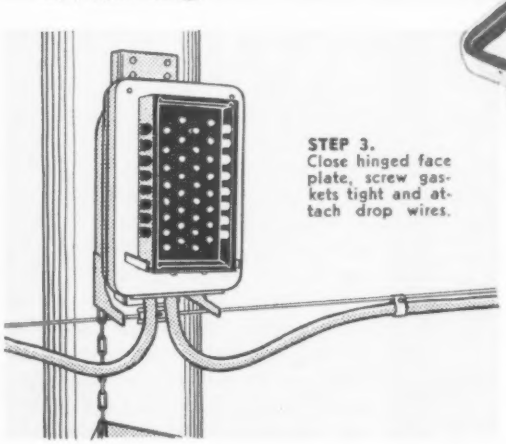
EVEN "IRMA" CAN INSTALL IT



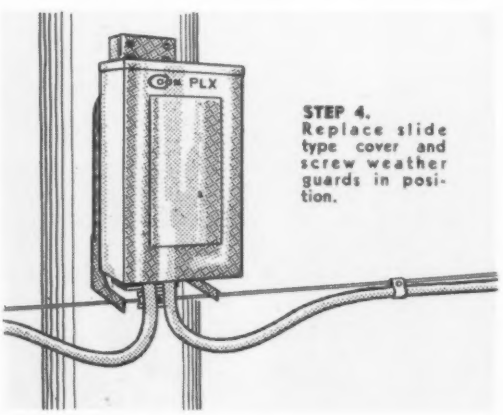
STEP 1.
Mount box, cut off sheath and loop cable through box grommet.



STEP 2.
Terminate pairs to face plate studs.



STEP 3.
Close hinged face plate, screw gaskets tight and attach drop wires.



STEP 4.
Replace slide type cover and screw weather guards in position.

CATALOG NUMBERS

PLX 6 Pair	452-1106
PLX 11 Pair	452-1111
PLX 16 Pair	452-1116
PLX 26 Pair	452-1126

The New COOK P-L-X

PLASTIC LOOP UNPROTECTED CABLE TERMINAL

is simple to install and designed for maintenance free operation.

Heavy galvanized steel frame and deep drawn chamber, welded zinc cover, and the famous XB Bakelite face plate with heavy Everdur studs comprise the major features of this new Plastic Loop Unprotected Pole Cable Terminal.

No stubbing, no splicing, no potting makes it better, simpler, and economical too.

When ordering, specify cable size so that correct size grommet is installed.

COOK ELECTRIC Company

2700 SOUTHPORT AVE. CHICAGO 14, ILLINOIS

sell its sytem to the Egyptian Telephone Cooperative Association, Steeleville. On the same date, the Baldwin Telephone Co. made application to sell its system to the Egyptian Telephone Cooperative Association.

V V

Virginia Company Applies for $104,872 Rate Increase

The Virginia Corporation Commission on Apr. 10 set a hearing for May 21 on an application of the Lee Telephone Co., Martinsville, for a new schedule of rates.

The company's application said the change would increase revenue by an estimated $104,872 annually.

The increase requested in station-to-station toll rates between points in its system is generally 5 cents. In Martinsville it asks to increase the rates for one-party residence service from $3.75 monthly to $4.50 and on one-party business from the present $5.50 to $8.50.

V V

Three Wisconsin Independents Apply for Rate Increases

The Wisconsin Public Service Commission, on Apr. 22, was to have heard the applications of the Arkansaw Telephnoe Co. and the Dallas Cooperative Telephone Co., for authority to increase rates.

The commission scheduled a hearing on Apr. 23 for the Rock River Telephone Co.'s application for authority to increase rates.

V V

Mountain States T & T Requests Rate Increases in Colorado

The Mountain States Telephone & Telegraph Co. on Apr. 3 applied to the Colorado Public Utilities Commission for rate increases. No amount was specified in the application.

The company asked merely for a hearing to determine "fair value of the company's property, a fair rate of return on that property and the revenues to which the company may be entitled." The commission set May 11 as the first hearing date.

The company got its last rate raise less than a year ago. It amounted to about $5,500,000 annually (TELEPHONY, May 24, p. 28).

But the company contended in its new application that taxes consumed more than half of the raise and that wage raises took another $1,740,000—leaving only about $815,000.

The company stated that, throughout 1952 the forces of inflation more and more seriously affected the company's operations—and hence its earnings. As a result, the company's earnings are continually declining—in 1952 they stood at only 5.3 per cent on the valuation set by the commission.

It is expected that under the present rates, net earnings for 1953 will have fallen to 4.6 per cent on the rate base at the end of 1953.

Listed as another important factor in the spiral was the higher cost for replacing equipment.

The company said also that "at today's inflationary prices, the depreciation reserve does not provide for the replacement of capital consumed in the operation of the business."

V V

New Rate Law Approved by Oregon Governor

Governor Patterson on Apr. 8 signed into Oregon law a bill providing that when any public utility rate is increased it shall not become effective for 30 days unless the Oregon Public Utilities Commissioner shall hold a hearing within that time.

The new law (H. B. 104) also makes provision for the manner of conducting such hearing.

V V

Approve Indiana Company Sale to Bell

The Indiana Public Service Commission on Apr. 13 approved plans of the Indiana Bell Telephone Co. to purchase the Bruceville Telephone Co.

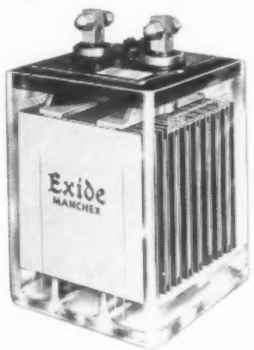
Approval of the Federal Communications Commission also must be obtained before the sale becomes final.

V V

Tenn. Legislature Passes Bill

A bill given final passage on Apr. 9 by the Tennessee Legislature and sent to the governor for signature, incorporates into one statute all laws dealing with procedure of the Tennessee Railroad & Public Utilities Commission.

"He wants to use the phone all the time since he learned that trick!"

Construction
With the Doubl
and America'
Exide-Manchex
telephone batteries


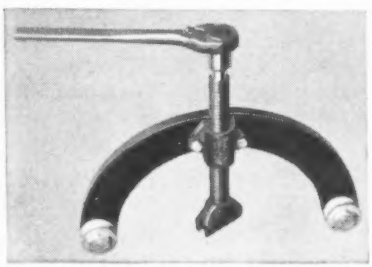
assure
positive operation
For Central Office
and Private Branch
Exchange Equipment
This is proven daily in exchanges of every
. . . for over 60 years Exide Batteries have
serving the Telephone Industry . . . the M
chester positive plate with its exclusive but
type construction provides exceptionally lo
life . . . latest developments on molded gl
jars permit compact space saving installati
. . . heavy terminal posts with copper inse
provide extra conductivity for sustained v
age at high discharge rates . . . microporo
rubber along with slotted plastic separat
are impervious to chemical and electrical
actions . . . plastic spacers assure plate ali
ment . . . for assured dependability, long l
and low-cost maintenance use Exide Manch
The Electric Storage Battery C
Philadelphia, Pa.
1888 . . . Dependable Batteries
for 65 Years . . . 19
STROMBERG
Telephone
CARLSON
TELEPHONES, SWITCHBOARDS • SOUN

laterials and Supplies . . .

uarantee of Stromberg-Carlson
eading Manufacturers . . .

ratchet handle slack puller

made by Cable Spinning Equipment Co.



The same dependable Slack Puller, but with a ratchet added. This type of handle enables the operator to pull slack with the Little Giant Slack Puller, requiring even less effort than would be needed with the conventional model.

The correct tool for those who use the Puller day after day.

The illustration above shows unit with cover removed.

Mfd. by Cook Electric Co.

the new

cook party line junction

(PROTECTED)

Here's an ideal unit for terminating and protecting the cable pair drop, the cable pair, and distributing four party line drops.

Circuit consists of ground stud, a pair of true gap lightning arresters, cable drop studs and heavy busses each equipped with four screw type terminals. Easy to install. All drop wires are doubly protected when used in conjunction with Cook substation protectors.

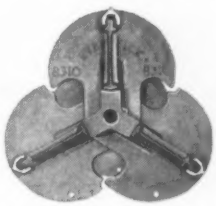
everstick anchors

. . . are designed to meet the most rigid anchoring and guying specifications.

The patented EVERSTICK Nut Housing locks anchor firmly on rod, making installation simple under all conditions and permitting easy recovery of the rod. Note well-designed, heavily constructed sections of metal in base plate.

EVERSTICK Expanding Plates are *ribbed* to double their original strength; their cutting edge and wedge shape arm socket reduces earth resistance to a minimum and assures easy expansion.

Three-Way EVERSTICK with expanding plates—contacts solid earth at every point around base plate, giving full benefit of earth's holding power.



Spreader Arms extra heavy ribbed with ball and socket joint at top and clinched socket on expanding plates allow heavy bearings to move freely with minimum friction, insuring easy expansion which eliminates buckling or breaking of arms.

EVERSTICK Anchor

. . . the anchor of merit

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Business-Government

(Continued from page 23)

most telephones, most kilowatt capacity, most gas pipelines, and everything else. Why wreck it after all these years and with such a record of success!

Those who really believe in regulation by the commissions want it to continue to do justice to ratepayer and investor alike. Those who would subordinate regulation to political expediency are those who do not really believe in regulation, and some of them would deliberately destroy the enterprise system in the utility business.

We cannot indefinitely continue to short-change the utility investor. I know that so far the telephone and other utility securities have held up remarkably well, even though comparable dividends and stock appreciation fall far below other securities wherein the investor is free to take his money if he so desires. It is no answer to say that utility securities are still in high favor with the investors. That is like saying that because the utility business is not dead yet nothing has happened to it. Sooner or later the investor is going to wake up to this policy of strait-jacketing utility earnings and then it may be too late. Humpty Dumpty only had to fall off the wall once!

There are five ways to bring about public ownership in the utility business. The first, and the only honest way, is by submitting it to the people or to their parliament for open approval as a considered policy—Do you want your government to take over the utility business or not? I do not think any one of us would have to be afraid of the answer, if the proposition were put on the line in such a truly democratic fashion. But the trouble with socialism is that it is just as dishonest in its approach as it is false in its performance of promised benefits. Public ownership has never been submitted to honest vote of the people in any such forthright fashion as a matter of national policy. That leads me to the other four methods.

The second method is piecemeal direct government adventures into business, such as the Reclamation Bureau and the Tennessee Valley Authority activities in the electric power field. These are usually begun under the disguise of doing something entirely different, or concealed as a by-product, or some other indirect way of accomplishing what would never be approved as an open, honest objective.

The third method is by government subsidy of competition. We see evidence of that in the use of federal loans or grants to local public agencies or cooperatives, such as resulted in the complete destruction of the electric power business in the state of Nebraska.

The fourth method would be by government seizure during labor disputes. We had a tiny taste of that during the coal mine seizures and the steel mill seizures of recent years. Those experiences were only temporary; the government operation was only a token or superficial control. But if such a policy were practiced long enough, and often enough, under a government subservient to labor unions, we could easily get permanent public ownership of our public utilities in that fashion.

The fifth form is the one we must guard against, more than any other, in the telephone business. It is a form of public ownership by default, through gradual destruction of investor confidence, through a perversion of the regulatory process. If utility earnings are to be steadily eroded by repressive regulation, there will inevitably come a time when private enterprise cannot build sufficient plant to serve adequately the public needs. It cannot build or expand them because the in-

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vestor will not risk his money in such confiscatory enterprise. Then you will have public ownership, and you can put the blame on some people who planned it that way from the very beginning.

I am not saying that all those who believe in strict original cost rate regulation have as their objective eventual public ownership of utilities. But I do know that some of those who have been in the forefront of creating and enforcing oppressive regulation are those who, by their past writings and past statements, have clearly shown—to my mind at least—that they never did believe in regulation of utilities as a continuing system of private enterprise. They believed in regulation only as a system of liquidation — a prelude to eventual public ownership.

The original cost zealot starts out in very easy stages. I have seen it all work out in the federal commissions. First he says he wants only to see that the company's books are kept on a cost basis, because that is the only way to eliminate the uncertainties of appraisal. The next step is a commission regulation that the utilities shall keep no other set of books or no other different kind of entries except the original cost books of accountants. The federal court allowed this in the Arkansas power case. So far, this is plausible enough. So far, it still has nothing to do with rates.

Then the next step is to refuse to consider, or even admit, any other kind of evidence of value except those on the original cost records. That happened in the Hope Case. The final step is to freeze the whole process by procedural regulation. There is right now under consideration of the Federal Power Commission a proposed *procedural* rule, which provides that no rate case can even be prepared in any other way except on a cost basis. When you go as far as that the utility is hog-tied. The regulatory strait jacket is completely tied up to the bare bones of the past.

So, I earnestly hope that the example of Ohio in resisting all these years this tremendous pressure (to reduce rate regulation to the status of a mere bookkeeping transaction) will continue to reflect the light of common sense for many years to come. During the past few months mandatory original cost legislation was rejected by the North Carolina Legislature, by the Maine Legislature, and by the Maryland Legislature. If Ohio and enough other states stand firm, we can keep the utility business free and prosperous for many years to come in this country of ours, and at the same time retain investor confidence.

Now we get back to a final consid-

in any emergency!

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The technical staff at Lowell Insulated Wire Company uses many physical tests to determine the effect of heat, aging, tensile strength, compression, cold, acids, oils, moisture and abrasion. They also employ extensive electrical tests. To create the maximum performance and dependability which is characteristic of Lowell Insulated Wire, many factors have been combined in a well balanced and efficient manufacturing process. That is why through long years in actual service Lowell Wires maintain a record for reliability and low maintenance or replacement costs. Write today for details.

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eration of what all these comments of mine so far have to do with the telephone business. I am sure many of you have been wondering about that. But if the very scope of this panoramic vision I spread before you has made no suggestion to your mind that the businessman, today, has to raise his sights when he considers his relationship to the federal government, then I am afraid I have not made myself as clear as I had hoped.

I would like, however, to leave with you just four points, by way of summary. The first point deals with *responsibility*. We must realize that the businessman is "on the spot" in this Eisenhower administration. For the past 20 years the businessman has been complaining about the government being run by a bunch of impractical college professors, or by other people who have never had to meet a payroll. Now, the Executive Branch of the government is studded with businessmen, most of whom have to meet payrolls, and have had to climb the ladder of success the hard way. As the head of the CIO summed it up, perhaps unfairly, the federal government is being run by 13 millionaires—and a plumber.

Our new Commerce Secretary Sinclair Weeks put it this way: "We have got to do a good job, otherwise there will be a big movement to the left worse than ever before." If business falls down on this responsibility, businessmen may be run out of the federal government for years — perhaps forever—if the enterprise system of business should collapse entirely under a renewed trend to socialism, and a purely Labor Government as in England.

Translating that thought into practical action, it means that businessmen (who are still in business) must cooperate generously with the businessmen in Washington who are now trying to put our federal government back on the track of common sense operation. It means we have got to be patient, and not ask for too much, too soon, whether it be in the form of tax reductions, or in the form of opposition to long-entrenched governmental activities which have irritated us, and are still irritating us. Eisenhower cannot afford to alienate any group by suddenly snatching away privileges or subsidies to which it has become accustomed. More than that, businessmen must set an example of sacrifice and cooperation during these critical times, so that labor, farmers, and other groups will be moved to do their part, as we hope they will.

My second point deals with *loyalty*. This follows from responsibility. As businessmen we must discipline ourselves. Our enterprise system does not pretend to economic infallibility, as communism does. We have got to expect that Eisenhower is going to make some mistakes. But his errors will be those of judgment—of balance, of *degree*, never of general direction. That alone demands the loyalty of businessmen.

The government is going to do some things we will not like at all. Each of us may have his own ideas about how to end the Korean War, or balance the budget, or reduce taxes, but we must remember that this is a representative republic, based on collective judgment. We need only consider the alternative to a failure of our business-minded administration to realize the truth of Benjamin Franklin's warning to the signers of the Declaration of Independence when he said: "We must all hang together, or assuredly we shall hang separately."

The third point deals with *faith*. It is ironic that communism, which has so little to offer as compared with our way of life, expects and gets from its followers so much blind devotion and sacrifice. We say we believe in the enterprise system. But what better way to faith than through understanding?

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We're proud to do our part in the defense program. The Neale Construction Company has been chosen by the Government for a number of outside plant construction jobs. And we have bent every effort to complete all our defense assignments in record time.

In the coming year there may well be still more defense work for us to perform. However, our telephone company customers may rest assured that we are still fulfilling our contracts for new construction, maintenance and emergency repair on time. We will be quick to notify you, if a defense contract will necessitate any postponement in scheduling work for you. You understand, of course, that vital communications for the defense of our country must come first.

These fine Signal Corps photographs show the men and equipment of the Neale Construction Company on the job at Fort Hood, Texas. Top picture shows the Neale Cable Spinner in operation. Center shows the full complement of Neale personnel assigned to the job. Bottom shows a crack Neale crew and their modern construction equipment.

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Today, business has a wonderful, unparalleled, and new opportunity for gaining prestige with the people in America. For 20 years business has been in the doghouse. What have we to say, now, to justify ourselves, to explain the role of business to other classes?

There are beautiful things, idealistic things to say about business—big and small. Have you ever considered, for example, that the business corporation is one of the most democratic institutions in the world? Its management has become more professionally competent and dedicated and responsible to the desires of customers, employes, and investors than any congressman trying to serve his constitutents. Nearly three times as many people own securities in your own telephone industry as work for it, and an increasing number of these security holders *are* employes of the industry. One could name other business firms, such as Sears, Roebuck & Co., where ownership is steadily moving into the hands of employes by the truly free and democratic method of stock ownership. This is a thrilling social experiment, such as the world has never seen.

My fourth and final point deals with *action*. What is the best way to accomplish these objectives of faith and sacrifice? I do not presume to give you any sermon, any list of dos and dont's. To my way of thinking, the very fact that you are here today, in a free and earnest assembly of the Ohio Independent Telephone Association, is the best evidence of your goodwill and cooperation. Separately, none of us have the wisdom to decide when to demand or yield, or compromise, in our business relations with government.

It is only the composite knowledge which we get in business association work at meetings, such as this on the state level, and in the work of your directly authorized business ambassador to Washington, the United States Independent Telephone Association, that we can be sure of our ground. When we cooperate in this work, we know that we are manning the post where we ought to be, and doing that which is best for all. If all of us in industry do this alone, we will not lack sage counsel, nor road maps, nor blueprints. We will know in our own minds, in our hearts, and in our actions that our part of the business community is keeping up its end in its relationship with government in Washington. This is at once both the opportunity and the cross which the businessman of today must take up. He cannot escape it. He cannot lay it down. He can only succeed with it. And that, with the help of God, is what he shall do.

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— SAYS THE GAMEWELL COMPANY

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RectiChargeR ® is the ideal time-tested equipment for Telephone service. Your supplier offers a COMPLETE Line for all requirements. Ask him for details, or write us direct.

RAYTHEON
Excellence in Electronics

Iowa Service Seen Model

(Concluded from page 60)

course will be given next year, as a follow-up for this year's course."

Mrs. Mildred Cessna, chairman of the association's Traffic Committee, reported:

"Our committee planned the Traffic Conference which opened with approximately 110 in attendance. A film 'The Skillful Operator' was presented. A demonstration and discussion on conference calls, toll operating practices with examples shown on a view-scope were instructive. The meeting was concluded with questions and answers on toll operating practices."

Other committee reports were given by Earle G. Bellamy, publicity chairman; Loyd F. Morrison, tariff chairman; and Verne B. Clarke, toll compensation chairman.

An interesting feature of the convention was the introduction of past presidents; Clyde McFarlin, Loyd Morrison, Henry F. Melick, Charles Farrington (53 years in the industry), Walter Fowler (54 years of service) and Earle G. Bellamy. Mr. Bellamy is the third generation of Iowa association presidents, both his father and grandfather having headed the Iowa association in years gone by. All these men were presented with framed plaques bearing the inscription:

"This certificate presented on Wednesday, April 3, 1953, at the 57th Annual Convention of the Iowa Independent Telephone Association held in Des Moines, Iowa.

"This written word can only record the event—the friendly warmth of those present and their sincere appreciation for the time and effort so freely given during the term as President can only be recorded in the hearts and minds of the fellow members of the Association."

Another feature of the convention was the Small Company Committee room which was shared by the Plant Committee. The headquarters of these two committees was visited by many and much valuable information was exchanged.

The last session was devoted to the Small Company Committee with John J. McIntosh, Cedar Rapids, chairman, presiding. There was an address, "Ordeal by Planning" by William M. Duvall, Cedar Rapids, public relations representative, Iowa Electric Light & Power Co., followed by a telephone symposium, a series of presentations by men from around Iowa, who had taken steps to improve telephone service in their respective communities.

The speakers were: Phil Garland, manager, Villisca Farmers Telephone Co.; Walter Geadelmann, president, Clarence Telephone Co., Inc.; Howard Macy, stockholder, Lynnville Community Telephone Co., Inc.; Casper Pannhoff, president, Miller Telephone Co., Inc.; R. E. Nielsen, manager, Ringsted Telephone Co.; and Frank Wieland, president, Otter Creek Telephone Co.

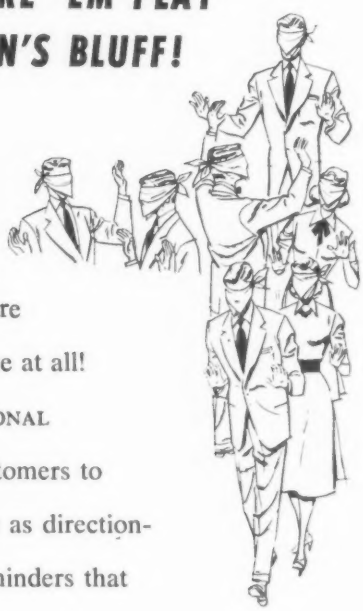
General Telephone Directory Co., Des Plaines, Ill., published a useful convention directory of those in attendance.

The convention elected the following directors: Howard C. Amick, Des Moines; Earle G. Bellamy, Knoxville; Roy E. Brandel, Mt. Pleasant; E. G. Carlson, Creston; Verne B. Clark, Lincoln, Neb.; C. A. Farrington, Centerville; W. H. Fowler, Pella; Frank Gordon, Fort Dodge; A. L. Kelley, Clarinda; Clyde McFarlin, Montezuma; John J. McIntosh, Cedar Rapids; H. Filmore Melick, West Liberty; L. F. Morrison, Grinnell; C. C. Pearce, Riceville; V. D. Peck, Primghar; Fred G. Pyle, Newton; A. W. Sanders, New London; J. A. Schuttloffel, Walnut; Harold Thompson, Clear Lake; Ross Vernon, Sioux Center; E. B. Zerwas, Manning.

The directors reelected the following officers: President, Mr. Pearce; first vice president, Mr. Carlson; second vice president, Mr. Vernon, and secretary-treasurer, W. F. Miller, Des Moines.

Tommy Telephone Says:

DON'T MAKE 'EM PLAY BLIND MAN'S BLUFF!



The telephone they *can't* find does more harm to public relations than no phone at all! Make it easy! Put GLADWIN DIRECTIONAL SIGNS at strategic points to guide customers to the phones. These will not only serve as direction-pointers . . . they will be advance reminders that telephone service is available!

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From Magneto To Dial

(Continued from page 38)

hear a dial tone when the dial instrument is connected to the line.

Testing for Ring

If it is a divided ringing system, that is, ring to ground, it may be necessary to reverse the line wires at the instrument or protector so that the telephones will ring on the assigned ring, which may be checked by dialing the proper ring back number.

If the subscriber's dial equipment has been installed and the wiring done as suggested, a minimum of time will be consumed in making the transfer from magneto to dial at the subscriber's premises. In most instances, it will be found desirable, as well as economical, to remove the magneto equipment while out on the job.

Simultaneous Cut-Over

Where the magneto plant is of such size that it becomes necessary or desirable to cut over all subscribers at one and the same time, the same procedure should be followed with regard to the conditioning of the open wire and loops in advance.

Because such plant usually already includes some cable and perhaps the present cable must be replaced as a whole or in part, additions to the cable plant are frequently necessary to provide additional service demanded because of the improved service rendered by the dial system.

In any event, it is quite likely that certain circuit changes will occur and be desirable during the planning and preparation of the dial conversion, so for that reason we have prepared *Table II*.

Any combined lengths of cable and open wire may be used as long as the total allowable resistance and transmission limits are not exceeded.

Fig. 4 shows various combinations of cable and open wire lines that may be used to create a satisfactory circuit.

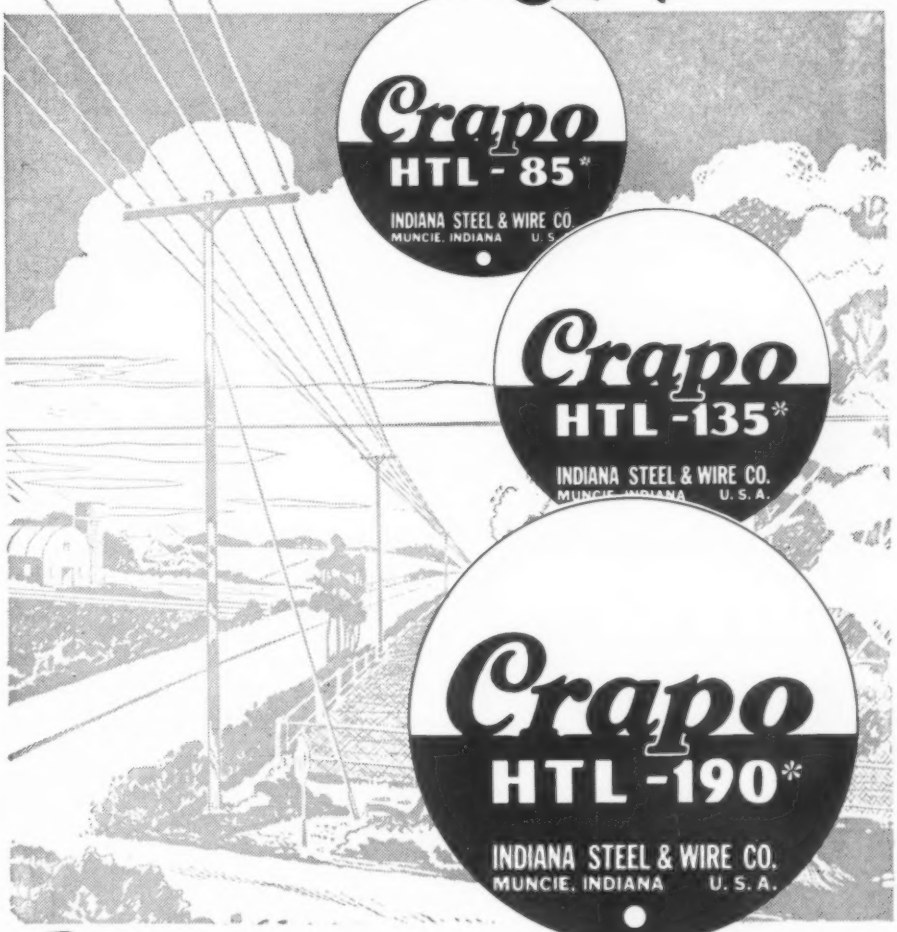
Combination Cables

Cables with several complements of different gauges in the same sheath are sometimes desirable. Cables containing two or more groups of pairs of different gauges are practical for certain installations and will prove economical in some instances.

Fig. 5 shows several practical combination cables from a service standpoint.

Combination cables should be selected

MEETING DEMANDS FOR *Longer* SPANS



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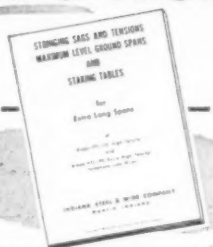

Write FOR THIS INFORMATIVE BOOK!

Engineering data includes Stringing Sags and Tensions, Maximum Level Ground Spans and Staking Tables for Extra Long Spans of *Crapo* HTL-135 High-Tensile and *Crapo* HTL-190 Extra High-Tensile Line Wire. Ask for Data Book No. 300!

● Spans up to *600 feet* are possible with *Crapo* HTL-190 Extra High-Tensile Telephone Line Wires — latest achievement by the makers of *Crapo* HTL-85 and *Crapo* HTL-135 High-Tensile line wires.

Crapo HTL-190 has been developed specifically to meet the need of the telephone industry for *extra* long span construction of rural lines. It is designed especially for use where telephone circuits and power lines are to occupy the same pole structures. *Crapo* HTL-190 is applicable to the construction of open wire lines, where terrain and other conditions permit *extra* long spans, and for river crossings.

For maximum savings in the construction and maintenance of rural communication lines, specify the *Crapo* Telephone Line Wire which best fits your requirements!

Crapo Telephone Line Wire, Steel Strand, Tie Wire, Cable Lashing Wire and associated items are distributed by leading jobbers. Ask your Jobber representative for complete information!

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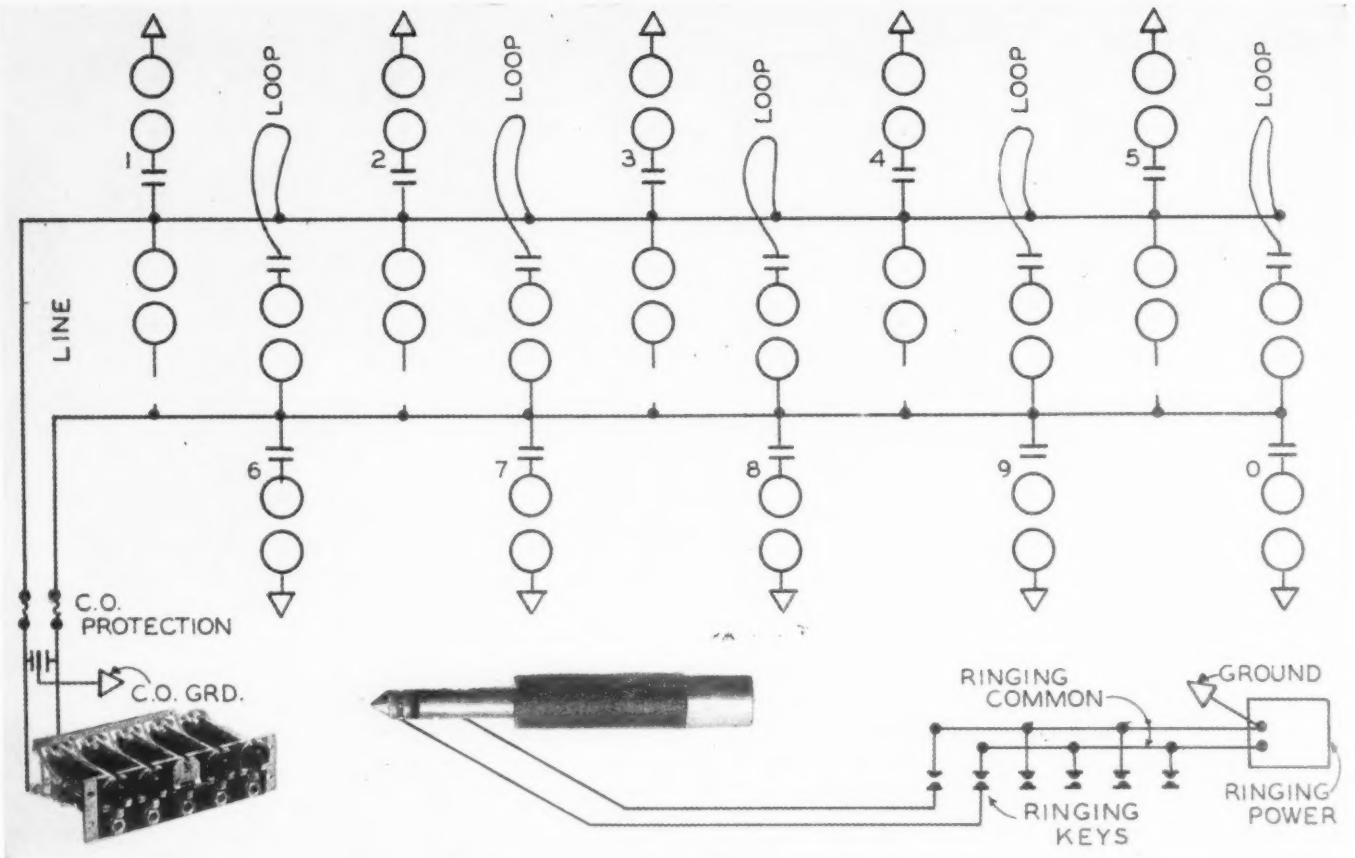


Fig. 7. Schematic diagram of ringing arrangement for dial conversion.

from a standard list because of the additional cost of tailor-made cable of this type.

Assuming that all the open wire and cable conditions have been met, we must now provide a definite method of connecting the subscriber's dial equipment to the present magneto line in such manner that neither instrument will interfere with the other before, during or after the cut-over.

Magneto Ringing Arrangements

Fig. 6 shows a schematic wiring diagram of the ringing circuit designed for use on small magneto systems where ringing power is available and the common hand generator is used as a standby.

Key S is used for switching from the commercial ringing power to the magneto generator. Such keys are already on all magneto switchboards utilizing two sources of ringing current.

Key G must be added. It is simply a device to ground either side of the ringing common. When the key is moved to Position 1, live current will flow out over ringing common No. 1 and ring the bells connected to that side of the line and ground; likewise, when the key is moved to Position 2, live current will flow out over common No. 2 and that side of the line, through the bells, to ground.

Because all magneto sets except those on grounded circuits are bridged across the line, it is necessary to first disconnect all the magneto bells and connect the dial instrument to the line together with the magneto set less the bells.

It is assumed that divided code ringing is to be used with rings 1, 2, 3, 4, 5 on one side of the line and 6, 7, 8, 9, 0 on the opposite side.

By having the operator move Key G to Position 1, which is now the 1, 2, 3, 4, 5 side of the line, then ringing in the normal manner, it is possible for the installer to quickly determine whether or not the line to the dial equipment must be reversed.

If the switchboard operator is not too busy, the subscriber may be instructed to answer his designated ring coming in on the dial set, but he must call and talk on the magneto instrument until the complete cut-over.

In preparation for this method, it is very important to check all the switchboard cords and plugs to be sure that all the tips are the same polarity. Likewise, all the sleeves must be alike and kept that way until the cut-over.

Fig. 7 shows a complete 10-party divided code ringing line arranged in advance of the dial cut-over.

In this case, one side of the central office ringing current supply must be permanently grounded as shown. By this method only, dial station 1, 2, 3, 4, 5 will receive the ring on the dial equipment and station 6, 7, 8, 9, 0 will receive the ring on the magneto set.

Here, too, it is extremely important to have all the tips of the plugs of the same polarity, as well as to have the sleeves of the opposite polarity.

Talking will be entirely on the magneto telephones up to the time of the cut-over to dial when subscribers will be notified to cut *loop* extending from their magneto bell boxes, which will have a tag attached saying "Cut this wire when notified."

Magneto generator shunts will be connected across the dial line and if this insulation is defective, the dialing impulses may cause a breakdown of the insulation causing a short.

The subscriber may also cause trouble by interfering with the generator handle, wiring, etc.

Therefore, it is desirable to remove all magneto equipment and unnecessary wiring from the subscriber's premises as quickly as possible after the cut-over.

V V

"Some people say government is a business. It is not a business. Government produces no wealth, but subsists by extracting wealth produced by business and individuals. Good government involves balance between necessary services and costs."—N. B. TRENHAM, general manager, California Taxpayers Association.

Microfilming Toll Tickets

(Continued from page 30)

we put the method in operation. We told the group what was coming and they were very enthusiastic about it.

How did we get started? We followed the Lincoln company's policy again and made a one-month trial of our small sub-exchanges. This gave our personnel a chance to get acquainted with the method and also provided a "trial balloon" for subscribers.

How did the subscribers receive it? We honestly had very, very few complaints and these were minor ones. The large toll users liked it very much because they could sort their own tickets and allocate their telephone expense to their various departments. The only group as a whole who objected were the various governmental agencies who always asked for the itemized toll statement in quadruplicate, or more, copies. Here we made a firm stand by politely informing them we had made a complete change; we did not have the personnel to make extra copies; we no longer had the toll statement forms; and the new method would save them money because their employes could not put personal calls on agencies' bills.

After nine months' operation under the system, we are very happy with the change. We do not have comptometers but we get along with special adding machines. Our microfilm machine photographs the tickets at the rate of approximately 200 tickets per minute. We could, if necessary, film all our tickets for one month's operation in one day, but the actual photographing is staggered over several days. The film is mailed at the end of the day to Minneapolis for processing.

If anything is wrong with the film, we are notified by noon of the next day so we could run the tickets through again. The developed film is back in our office on the third day. The cost of the film is $7.00 per roll which includes developing. Thirty thousand tickets can be photographed on one 200-foot film. The machine photographs the face of the ticket only, although it is equipped to photograph both sides if desired. The experience of the Lincoln company and our company indicates that photographing the face of the ticket is sufficient.

There are several makes of microfilming equipment on the market and any good office supply store can help you get the information on them. We also purchased a viewer which projects the film on a small white screen. If any subscriber wants to see the film, we gladly show it to them. It can also

HUBEYE BOLTS, EYES, AND NUTS

The large-radius rounded section of the HUBEYE prevents excessive localized strain on the guy, and the smoothly-rounded high sidewalls prevent concentrated strain on individual strands.

HUBEYE popularity has led to its standardization for all Hubbard attachments where time, money and maintenance are saved by elimination of the thimble.

The drop-forged eye is stronger than the rod section from which it is formed. All HUBEYE items are protected against corrosion by Hubbard Double-Dip Hot Galvanizing.

"Hang the Load on Hubbard Hardware!"

OVERHEAD

Cable Suspension Material—Wireholders Pole Seats and Balconies—Clevises Braces—Drive Hooks—Messenger Dead Ends—Extension Arms—Long Span Material—Pins—Clamps—Guards—Stubbing Bands—Guy Protectors—Guy Clamps Pole Struts—Clips—Straps—Hangers Carriage Bolts—Rings—Transposition Brackets—Eye Bolts—Pole, Corner and House Brackets—Guy Hooks—Strain Plates—Storm Guy Straps—Lags—Machine and Hubeye Bolts—Sidewalk Guys REA Telephone Hardware

UNDERGROUND

Cable Racks—Manhole Ladders and Steps Pulling-in Irons—Expanding Anchors Cable Shields—Screw Steelwing Anchors Anchor Rods—Ground Rods and Clamps

HUBBARD AND COMPANY

ESTABLISHED 1843

PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA

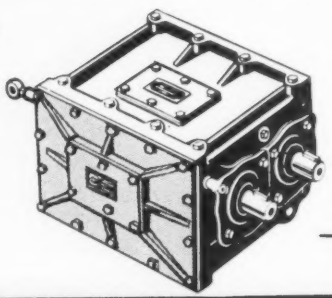
Convert Your FORD TRUCK with a Tel-E-Lect DERRICK-DIGGER KIT

Now there's a Tel-E-Lect Derrick and Digger mounting assembly tailored for the front end of your Ford truck. Cab-controlled, it will handle poles up to 40′ long, requires only two men to handle and can easily be attached to your Ford by your local mechanic. Digs holes and sets poles, with interchangeable auger sizes from 8″ to 20″. *Send for bulletin describing all three models to suit your job requirements.*

Makes It Easy For TWO MEN To Solve Tough Pole Line Problems

Forward and Reverse Transmission

This unit is included in all Ford conversion kits. Enables the operator instantly to raise or lower either the winch line or derrick. Gives instant forward or reverse rotation to the winch without shifting PTO, and without using the truck clutch.



Earth Boring Equipment for All Types of Trucks

Tel-E-Lect PRODUCTS, INC.

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Minneapolis 16, Minnesota

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when it is so easy to install
SIGNAL
Telephone Ringing
RELAY SETS and accessory
SIGNAL
Equipment

Immediately Available **FOR CIVILIAN DEFENSE**

These Relay sets have already been installed in many leading communities for operation of Civilian Defense Alarms.

The SIGNAL Relay Set can be installed quickly and easily. It is designed to operate on standard telephone ringing current of 15 milliamperes at 90 volts, 20 cycles.

The Telephone Ringing Relay Set has been proved in service and is of the same high quality which characterizes all relays, devices, and control systems built by the Signal Engineering and Mfg. Co.

Sales Representatives in Principal Cities.

Write for Catalog TR-4

Wheelock RELAYS
SIGNAL
ENGINEERING & MFG. CO.
154 WEST 14TH ST. NEW YORK 11 N.Y.

be used to make extra copies if the subscriber loses his toll tickets. Actually the viewer is rarely used.

Previous to microfilming, our toll billing clerk spent the first few days after the bills were out looking up information on tickets for calls the subscriber wanted checked. This is now unnecessary as the subscriber can check his own ticket. Our toll billing clerk has said she would be lost if we returned to the old method, and the whole department seems satisfied with the new operation.

7 Sources of Assistance

(Continued from page 42)

brush up on mathematics first. Part of the text of a technical book is written in mathematical formulas. If you cannot read these formulas you cannot understand the book. In this case, the remedy is to study mathematics.

(6) *Study specifications, circuit drawings, and circuit descriptions.* In some offices these items are kept locked up and are used only when they are necessary to clear a particular case of trouble. There is much educational value in equipment specifications, circuit drawings, and circuit descriptions which are found in every office. All concerned should study them through and through. Be prepared for anything that may come up. We know of many owners and managers of small companies who do not understand the simple cord circuit of their magneto switchboards, even though they have plenty of drawings and literature at hand. How can they, or their maintenance men ever hope to maintain automatic equipment if they are forced to install it?

(7) *Subscribe to trade journals.* The trade journal (such as TELEPHONY) is more important to the telephone man than his daily newspaper. It brings information that means bread and butter to him. A text book may be several years old when you get it, but the weekly trade journal presents up-to-date data. There are articles on every phase of the business, articles for management, the plant men, the operators, the commercial people. Some of the serial articles are equivalent to a course of study. Also, all advertisements present the latest information on new methods and products.

The trade journal benefits not only the manager or owner directly but indirectly by helping his people. It should be made available to all employes even if more than one copy is required.

We will close this article by repeat-

ing a statement that we have made several times in this series. "We believe that the small company can give just as good service as the large company and can be just as systematic and just as up-to-date as the large company." One way to accomplish this end is by continuous education in the telephone business on the part of the owner, manager and employes of the small companies. In this article we have pointed out several ways in which this can be done. There are, of course, other ways.

V V

AT&T Tells Plans for New Buffalo-Cleveland Relay Route

Plans for a new radio relay route between Buffalo, N. Y. and Cleveland, O., to provide additional network circuits were announced on Apr. 6 by American Telephone & Telegraph Co.

The 180-mile series of microwave towers is due for completion late this year, AT&T's Long Lines Department said. The five towers of steel construction will range from 162 to 235 feet in height.

Lens-type antennae atop the towers will relay the microwave radio beams providing wide band communications channels suitable for television circuits or telephone use. The new route is a line in a planned second radio relay system between New York and Chicago, to supplement one put in service in September, 1950.

V V

U. S. Chamber of Commerce News Discusses Land Ownership

A recent *Business News Feature* of the Chamber of Commerce of the United States asks "Who Owns the Land?" and answers the question like this:

"Most people don't know it, but our national government owns almost one-fourth of all the land in the United States, or more than 455 million acres. That's an area equal to the New England States, New York, Pennsylvania, Delaware, New Jersey, Maryland and the District of Columbia.

"Some of the western states are owned almost entirely by the national government. Take Nevada, for example. Uncle Sam owns 87 per cent of all the land in Nevada.

"A good portion of this government land is timberland — some 91 million acres, or about 40 per cent of this country's commercial standing timber. And the government recently has had its eyes on 35 million acres of private timberland which federal officials wanted to add to the national forests. The trend has constantly been toward increased federal land holdings.

"Since the federal government pays no taxes on its land, this means that private landowners must pay higher state and local taxes. And they must pay higher federal taxes to support the government bureaus which manage the land.

"That's why business men—through the Chamber of Commerce of the United States—have offered a solution. They have recommended that Congress make a study of the government's real estate holdings to determine just what property is best suited for private ownership. The idea is that property which can best serve the public interest through private ownership should be offered for sale as soon as possible. The land then could be put on the tax rolls and placed in productive use by private owners."

V V

G. W. Rodormer Hospitalized

George W. Rodormer, secretary of the Reliable Electric Co., recently was confined to the St. Francis Hospital, 355 Ridge Ave., Evanston, Ill. Mr. Rodormer resides at 722 N. Prospect St., Park Ridge, Ill.

Put the "B" on Your Problems

The Neale Model B is designed for one-man operation. It may be used with equal effectiveness for spinning new cable or maintenance spinning of existing cable. This machine is easy to transfer at pole . . . simply by removing the gate in the spinner head. Many telephone companies . . . large and small . . . have reported success in using this cable spinner to reduce outside plant costs and solve problems of new construction and maintenance.

Contact Your Jobber

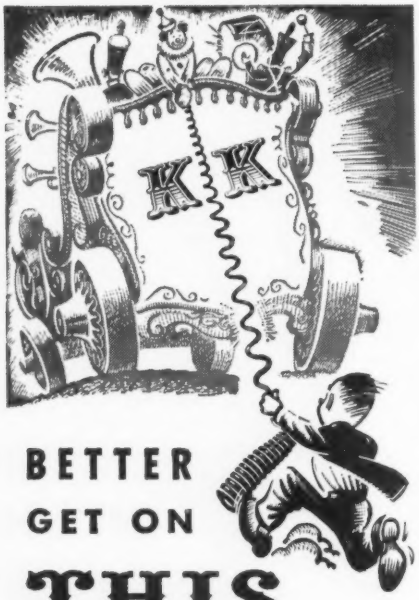
For Best Results Use Neale Wire

Available in 7 different types . . . all made to meet the toughest construction and corrosion problems.

THE WORLD IS SPINNING—TOO!
PHONE 2-7234-5

Cable Spinning Equipment Co.

3100 TOPEKA AVE. TOPEKA, KANSAS



BETTER GET ON THIS BANDWAGON

Koiled Kords are popular with telephone subscribers. They like the way Koiled Kords help make it more convenient to use the phone.

Consumer acceptance is the BIG reason why more and more independent telephone companies are installing new telephones already equipped with Koiled Kords. This rate of growth means that soon, phones with Koiled Kords will be the rule rather than the exception.

Koiled Kords offer users the genuine benefits that help attract new business, keep present subscribers happy. Koiled Kords S-T-R-E-T-C-H to five times their retracted length as needed with only one pound pull, retract to their original neat coil when released.

Koiled Kords reduce maintenance costs, because Koiled Kords eliminate the kinking, dangling, tripping and catching that are the chief reasons for damage to equipment and breaks in service with old style cords. Neoprene outer jacket cannot fray. Koiled Kords are unharmed by perspiration, humidity, oil, water, grease or acid.

Anticipate subscribers' preferences, keep your equipment modern, up-to-date. Specify Koiled Kords from your independent telephone supplier.

Koiled Kords
INCORPORATED
BOX K
NEW HAVEN 14, CONN.

Outdoor Paystations

(Continued from page 25)

one case where a booth was partially tipped from its moorings. As mentioned previously, if the booths are placed in good locations, it minimizes the possibility of damage. Local county and state police usually are agreeable to the patrolling of outdoor locations as they find the outdoor telephones are valuable assets and adjuncts to their radio-telephone facilities at night.

The average cost for the installation of an outdoor paystation has been $600. This includes the cost of the booth, labor, paystation instrument, and other miscellaneous items.

No more than ordinary maintenance is required for outdoor paystations. Particular care should be taken, however, to keep the booths clean, all lights in working order and the telephone directory in a usable condition. The last point can be supervised by the paystation collector.

Now what can the telephone company expect in the way of revenue from outdoor paystations? Here are a few case histories from the records of General Telephone Co. of Pennsylvania:

CASE NUMBER 1

EXCHANGE SIZE: 1,172 stations.
PAYSTATION LOCATION: Community park centrally located in town.
INSTALLATION DATE: June, 1952.
REVENUE: June-December, 1952.

June	$ 13.45
July	37.95
August	99.85
September	106.40
October	83.85
November	90.40
December	75.20
Total for Period	$557.10
Monthly Average	$ 79.60

Should the extension of telephone service into a new housing project be delayed, outdoor paystations will serve the area temporarily.

This outdoor paystation is located near the entrance to a commercial amusement park, and a state park. Although its usage is largely seasonal, it provides a convenience to vacationers.

CASE NUMBER 2

EXCHANGE SIZE: 905 stations.

PAYSTATION LOCATION: Near intersection of two main highways, on the premises of a gasoline station.

INSTALLATION DATE: July, 1952.

REVENUE: July-December, 1952.

July	$ 18.25
August	83.10
September	91.85
October	68.75
November	49.25
December	57.70
Total for Period	$368.90
Monthly Average	$ 61.50

* * *

CASE NUMBER 3

EXCHANGE SIZE: 986 stations.

PAYSTATION LOCATION: Originally booth was placed in the center of town, on a side street about 200 feet west of a main highway. In June, 1952, it was moved 200 feet east to a point directly along the highway. In the revenue figures, note how collections increased after the booth was moved.

INSTALLATION DATE: April, 1950.

REVENUE: January-December, 1952.

January	$ 49.40
February	51.25
March	60.35
April	69.25
May	65.50
June	95.80
July	115.05
August	74.35
September	110.65
October	72.90
November	112.25
December	85.35
Total for Period	$962.10
Monthly Average	$ 80.15

* * *

CASE NUMBER 4

EXCHANGE SIZE: 60,327 stations.

PAYSTATION LOCATION: In a new housing project near the outer limits of the city. When families began moving into the project, the extension of outside plant into the area was not quite ready. As a temporary measure, two outdoor paystations were established. This was in November, 1951. During the following month, December, 1951, the outside project was completed, making telephone service available to those who desired it. In looking at the revenue figures for the two paystations, note how collections gradually decreased as more and more telephones were installed. The paystations will soon be removed and placed in better locations.

INSTALLATION DATE: November, 1951.

it's dated

YOU CAN PROVE IT TO YOURSELF!

ALPHADUCT DUMBBELL TYPE
NEOPRENE JACKETED DROP WIRE

LASTS LONGER • COSTS LESS!

Every coil of ALPHADUCT drop wire is dated by means of a color coded thread which indicates the year it was manufactured. In this way, with no record keeping, no muss, fuss or bother, you can tell how long Alphaduct stays up without requiring service or replacement.

We know that our dumbbell type neoprene jacketed drop wire will last. It's tested thoroughly through every manufacturing stage. The tough neoprene jacket resists abrasion, moisture, sunlight, oil, water. The insulation sticks tightly to the conductor. The dumbbell or figure eight shape makes the wire easy to split, makes a neat installation.

You, too, may know all this for sure by trying Alphaduct drop wire. And . . . by dating the wire we make it easy for you to prove to yourself that this is the most sensible drop wire investment you've ever made.

IT'S DATED • FOR YOUR CONVENIENCE AND PROTECTION

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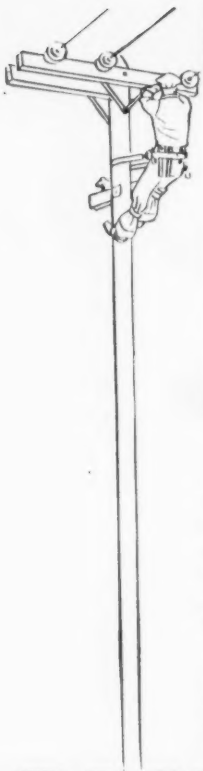
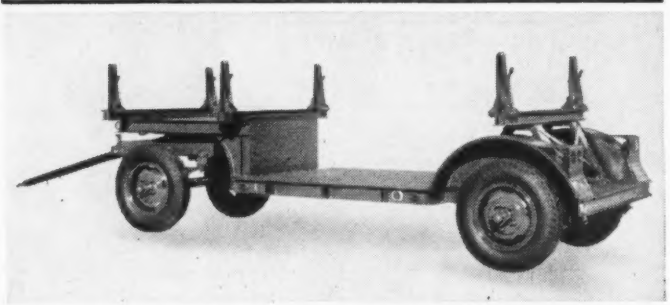
PANKEY SUPPLY COMPANY, CHARLOTTSVILLE, VA.



DESIGNED TO MEET YOUR NEEDS... in Line Construction and Maintenance



BUILT LOW FOR EASIER LOADING AND HAULING — THE EAGLE 4-WHEEL LO-BED TRAILER

Transformers and other heavy, bulky units are easy to load and carry on this trailer. Big, roomy, low platform. Also suited to pole and general purpose hauling. Full 90° turn with front dolly; 5th wheel type steer. Heavy duty construction; low center of gravity keeps load steady enroute. Equipped with pole bolsters.

5 tons capacity; over-all length, including tongue, 25 ft. 8 inches. Distance ground to low platform only 25-1/2 inches. Weight 5400 lbs. Equipped with electric brakes on rear wheels. Send for complete information on Model 6441—Eagle LO-BED Trailer.

EAGLE

EAGLE MANUFACTURING CO.
Division of
The Four Wheel Drive Auto Co.
APPLETON, WISCONSIN

Utility Bodies • Trailers • Pole Derricks
Tools and Accessories
Eagle equipment is engineered by and for utility men expressly for their needs

Distributed by Graybar

Send today for the complete catalog of Eagle Line Construction and Maintenance Equipment -- a useful reference book.

CLEARS TROUBLE IN A HURRY

Averages $6.00 Saving Per Fault

This easy-to-use Wheatstone Bridge puts its finger on faults — locates grounds, crosses or opens — enables trouble-shooters to clear lines or cables in minimum time.

A recent survey among users indicates that this Test Set saves from 1 to 8 hours in locating faults, as compared with other methods. In terms of man-hour cost of trouble-shooting, it saves an average of $6.00 per fault. From this average figure, it appears that after locating 25 faults the instrument has saved enough to pay for itself. After its 25th location, this Test Set is actually earning money.

These savings, as well as the benefits of subscriber good-will are yours with the purchase of one of these Test Sets. If more information is required, write for Catalog EF22-53-442(1).

A FREE HANDBOOK explaining methods of using this Bridge for locating grounds, crosses, opens and other faults, will be sent on request. Write for Note Book EF-53-441(1), "Notes on Fault Location in Cables".

5430-A Type U Test Set

LEEDS & NORTHRUP COMPANY, 4901 STENTON AVE., PHILA. 44, PA.
LEEDS & NORTHRUP
MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

Jrl. Ad. E-53-441(4a)

REVENUE: January-December, 1952.

	Paystation No. 1	Paystation No. 2
January	$ 36.35	$ 38.05
February	23.40	21.55
March	16.70	24.45
April	20.90	22.90
May	24.00	16.90
June	22.50	14.90
July	18.45	10.95
August	17.40	11.90
September	14.45	9.35
October	6.05	4.05
November	8.30	5.00
December	20.80	18.75
Totals for Period	$229.30	$199.20
Monthly Average	$ 19.10	$ 16.60

* * *

CASE NUMBER 5

EXCHANGE SIZE: 2,477 stations.

PAYSTATION LOCATION: Along the town's main street, directly in front of the telephone company's business office. Concurrent with the establishment of this paystation, an indoor paystation in the business office was discontinued. In the figures below, note the increase in the outdoor paystation revenue over the indoor. The figures from March through April, 1951, are for the indoor paystation.

INSTALLATION DATE: August, 1951.

REVENUE: March-December, 1951.

March	$ 3.10
April	3.85
May	1.60
June	3.40
July	7.80
August	4.65
September	21.80
October	56.95
November	37.60
December	38.20
Total for Period	$178.95
Monthly Average	$ 17.90

NOTE: The monthly average for 1952 was $77.05.

* * *

CASE NUMBER 6

EXCHANGE SIZE: 60,327 stations.

PAYSTATION LOCATION: In a summer resort area at a point from which the public can enter either a commercial amusement park or a state park. The paystation gets its greatest usage during the summer months. It was established primarily for the convenience of vacationers.

INSTALLATION DATE: May, 1951.

REVENUE: January-December, 1952.

January	$ 10.15
February	7.85

LENZ SWITCHBOARD CORDS

LOOK FOR LENZ THIS MARK OF QUALITY

For 49 years we have been manufacturing Cords, Wires and Cables for the Telephone Industry.

Lenz NYLON Switchboard Cords have been in continuous service for over five years. Improve your service plus greater economy with these outstanding cords. Write today for complete information.

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1751 N. WESTERN AVE., CHICAGO 47, ILL., U. S. A.

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QUALITY
SERVICE
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We distribute the best and only the best in Telephone Supplies

- ★★ **Neoprene Jacketed DROP WIRE, DATED.**
- ★★ **Neoprene Jacketed BRIDLE WIRE.**
- ★★ **Plastic or Glazed Braid Inside Wire.**
- ★★ **Telephone Cords.**
- ★★ **ANKOSEAL PLASTIC CABLE; Aerial, Duct, Inside, Direct Burial. The latest in Telephone Cables. Costs less to install than Lead Cable.**
- ★★ **Cook Protective and Terminal Equipment.**
- ★★ **Joslyn Pole Line Hardware and Supplies.**
- ★★ **Nicopress Sleeves, Tools.**

Plus many other supplies.

**Have in stock complete line DROP WIRE in 17 and 18 ga., twisted pair, parallel, dumb-bell, reinforced type, neoprene jacketed and WP braided.
All DROP WIRE is new material.

**New type field wire, D-1-A, tw. pr., 4 copper 3 steel strands per cond., plastic, nylon ins., latest army type tel. wire @ $25.00/mile reel. (Qty. discounts)

IN STOCK

**W-110-B, tw.pr., WP tel. wire; 4 steel 3 copper strands per cond., on One Mile steel reels, UNUSED @ $12.00/mile reel.

**Magneto Ringer Boxes:
3 bar-1000 Ohm @ $4.00 ea.
4 bar-1600 Ohm @ $7.00 ea.
5 bar-2500 Ohm @ $8.50 ea.

**Battery Boxes, 3 cell, Paragon, NEW packed in cartons of 12 ea. @ $1.10 ea.

**Ringer Boxes: C.B., metal box, complete W.E. #534 . . . $3.00 each.
S.C. #1158-B . . . $1.50 each.
Kellogg #610, etc. . . . . $1.50 each.
A.E. equal to WE #534 (complete w/ terminals, condenser, induction coil, ringer) @ $1.50 ea. 1400 Ohm, SL.

**W.E. #392—Loud Ringing Bells, WP, outside or inside use, w/6" gongs and condenser @ $9.00 each.

**Wire Chief Test Set-EE-65, an all purpose portable test set for central office or line. BRAND NEW and complete with handset and plug @ $39.50 ea.

**W.E. Operator Head & Chest set, New, complete w/#396 trans., #716 Receiver, cords and #289-B plug @ $8.00 ea.

**Switchboard Cords—3 cond., 5 ft., Red, New, Mfd. by Runzel and same as W.E. S3B. Fits WE Plug 110, 310; Kellogg 106 @ $60.00/C—Each $.65.

**TELEPHONES

*W.E. #325-Weatherproof, outdoor type, complete w/F-1 handset, dial blanked for C.B. or dial use @ $35.00 each.

*Kellogg, #4901-A, Weatherproof, outdoor type, complete, dial blanked @ $20.00 ea.

*W.E. #202-desk handset telephone, w/E-1 handset w/F-1 trans. unit; complete, for C.B. or Magneto service . . . . . $10.00 ea.

*A.E. type 1-A desk handset phone, complete for C.B. or Magneto service . . . . . $6.50 ea.

*Federal Telephone, 802-A, latest type, self-contained desk phone equal W.E. #302, C.B., dial blanked. Can also be used for dial . . . . $13.00 each.

**Federal Telephone, Magneto, 804-A, excellent condition, complete with new cords, latest model Desk handset, self-contained magneto telephone, easily convertible for Wall use . . . . @ $19.50 each

*Dials: W.E. #5H . . . $4.50 each.
A.E. #24A36 . . . $3.50 each.

**W.E. Central Office Protector, 20 pair, #1269-A, like new, complete with carbons, porcelains & #76-A heat coils @ $17.50 each.

All Material Excellent Condition or New and Fully Guaranteed. Terms: 1% 10 days, Net 30; FOB New York

TELE-WIRE SUPPLY CO., INC.

Distributors of Telephone Supplies

136 Maiden Lane **HAnover 2-9690** **New York 38, N. Y.**

March	—
April	13.85
May	41.00
June	65.05
July	138.70
August	130.05
September	63.70
October	26.05
November	18.50
December	16.65
Total for Period	$531.55
Monthly Average	$ 44.30

* * *

CASE NUMBER 7

EXCHANGE SIZE: 60,327 stations.

PAYSTATION LOCATION: On the premises of the state park mentioned in Case Number 6, directly adjacent to the office of the park authorities. Practically all the revenue from paystations in this type of location is derived during the vacation season. During the off-season, there may be little or no revenue.

INSTALLATION DATE: January, 1952.

REVENUE: January-December, 1952.

January	—
February	—
March	—
April	—
May	—
June	$ 57.20
July	75.05
August	61.65
September	—
October	13.10
November	.95
December	.25
Total for Period	$208.20
Monthly Average	$ 17.35

* * *

CASE NUMBER 8

EXCHANGE SIZE: 60,327 stations.

PAYSTATION LOCATION: Along the highway in a fairly well developed suburban area that is also a summer vacation spot. The exact location of the booth is in the area's shopping center.

INSTALLATION DATE: June, 1952.

REVENUE: July-December, 1952.

July	$ 66.80
August	95.50
September	68.80
October	31.40
November	29.95
December	23.90
Total for Period	$316.35
Monthly Average	$ 52.70

* * *

Today, General Telephone Co. of Pennsylvania has 31 outdoor paystations in service. More will be established as the company continues its program for the development of this type of service.

Whether large or small, all telephone companies can be well served by outdoor paystations. It will be the rare exchange that does not have a need for at least one. The opportunity is there —don't pass it up.

For serving residents and transients, a good spot in town for an outdoor paystation is at the junction of main highways. The projection on the side of the booth forms a shelf for the telephone directory.

ACORN INSULATED WIRE

Acorn wire has meant quality since 1914. Neoprene jacketed for drop, distributing and bridle wire. Acorn plastic insulation for inside, jumper and cross connecting wire. Specify Acorn.

ACORN INSULATED WIRE CO., INC.

36 FREEMAN STREET, PAWTUCKET, RHODE ISLAND

LEICH SALES CORP., 427 W. Randolph St., Chicago

THE LINDSAY TELEPHONE SUPPLY CO., 7016 Euclid Ave., Cleveland

NORTH ELECTRIC MANUFACTURING COMPANY, 501 South Market Street, Galion, Ohio

Radio Interference

(Continued from page 52)

A choke coil operates on the principle that a low frequency current will pass through it more easily than will a high frequency. Therefore, a small choke can be inserted in a telephone line, which will pass voice frequencies, but which will block radio frequencies. However, the dc resistance of the wire in the choke coil will have the effect of increasing the loop resistance of the line.

If the interference is caused by a high frequency station, a choke of the above mentioned value may prove ineffective. However, chokes are available for all frequencies, and at least one manufacturer makes chokes which have name-plate ratings which correspond to the center frequency they are designed to suppress. For example, a Z-14 choke is effective for signals of from about seven to 35 megacycles.

In the case of amateur stations, a party line telephone with ground-return ringer may be located on the premises. In this case, the inside wire may pick up the signal and carry it to the pole, where it may affect many other circuits. Of course, this may happen on any telephone line, but grounded ringer circuits are particularly susceptible. The use of a radio frequency choke in the ground leg of the inside wire is usually the most effective remedy in these cases.

Corrective Measures at the Radio Station. If several telephones are affected by one radio transmitter, it is usually wise to consider corrective measures at the radio station, rather than equip a number of telephones with filters.

Trouble at the radio station may be pick-up on the inside wire with transmittal to the pole, as noted above. Pick-up may also be via the power wires, which will also carry the signal to the pole, and thence to other telephone lines.

Troubles of this nature are generally found at amateur stations where the radio equipment is often experimental in construction, and not adequately shielded or grounded. Pick-up by the power wires is corrected by series chokes, or condensers to ground, either at the radio station or at the meter. However, the chokes must be of sufficient size to handle the power load. Such filter equipment is available commercially, and directions for building it may be found in the "Radio Amateur's Handbook" published by the American Radio Relay League, West Hartford, Conn.

It is the responsibility of the radio station owner, not the telephone company, to provide power line filters. However, amateurs are usually very cooperative in these matters and will often furnish filters for the telephone line as well.

Another precaution to be taken at the radio station is proper grounding of the chassis or cabinet housing the radio equipment. Safety alone dictates that all such equipment should be grounded, but this is not always done. The equipment should be connected to a good water pipe ground, but an important precaution enters here.

The ground wire, including the amount of pipe from the clamp connection to the point where the pipe enters the ground, must not be an odd multiple of a quarter-wave-length at the frequency the station is using. A station which has a wave-length of 10 meters, for example, must not use a ground wire that is 2½ meters, 7½ meters, 12½ meters, etc., long. Ideal lengths are half-waves, such as five meters, 10 or 15 meters. (A meter is about 39⅜ inches.)

If this precaution is not observed,

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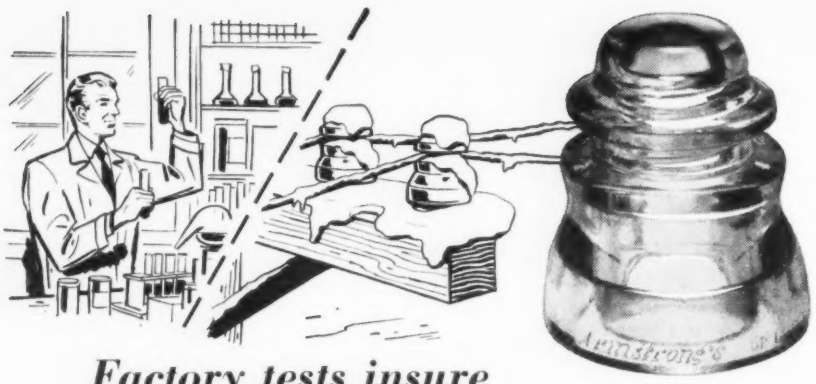

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the ground wire may radiate signals as well as the antenna, and the ground wire is usually closer to telephone lines. The ground wire is, of course, the responsibility of the station owner, and he will be able to calculate the critical lengths for his station, once the need is called to his attention.

Standing Waves

Another condition which can cause interference is found at stations which use the same antenna to transmit signals on different frequencies. Ordinarily, a well designed antenna works at maximum efficiency only at one frequency. When other frequencies are used, such as by government, overseas and amateur stations, the antenna will not "take" all the power being supplied to it. This results in some of the power being reflected back down the transmission line, or lead-in from the antenna back to the station.

As this returning wave meets the new oncoming waves being sent, points of high voltage and high current build up. This condition is known as standing waves. These waves may become strong enough to melt the lead-in wire in spots, while the rest of it remains cool.

If such a point, containing a high voltage standing wave is close to a telephone line, it will cause a great amount of interference, which probably cannot be removed by filters. Even the use of shielded or coaxial cable by the radio station may not cure the trouble, for these standing waves can form on the outside.

The remedy for this condition is to try to prevail upon the station owner to provide a better match between his antenna and transmission line, or to move the line, or to move the telephone line.

The matter of shielding the radio apparatus, or housing it in a grounded metal cabinet is probably of little importance to telephone companies, because absence of such shielding is likely only to interfere with the station owner's own telephone, but it may be a last resort measure.

In this connection, it is worthy of note that the ventilating holes in such cabinets should be round, rather than rectangular or slotted. If of the latter shape, the holes can act similar to the slot antennas used on aircraft, and radiate harmonics of the frequency being used.

While this will not affect telephone lines, it will cause television interference and trouble to other radio stations, and the station owner may be glad to have it called to his attention. If the holes cannot be changed, they

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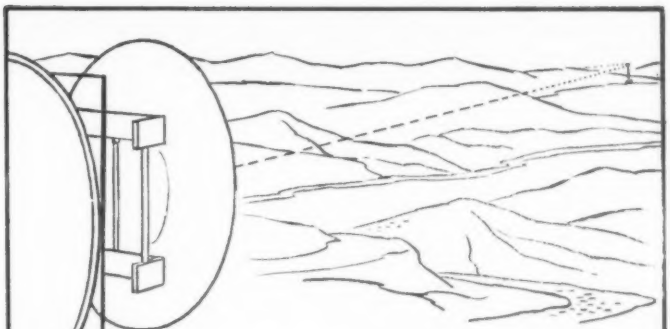

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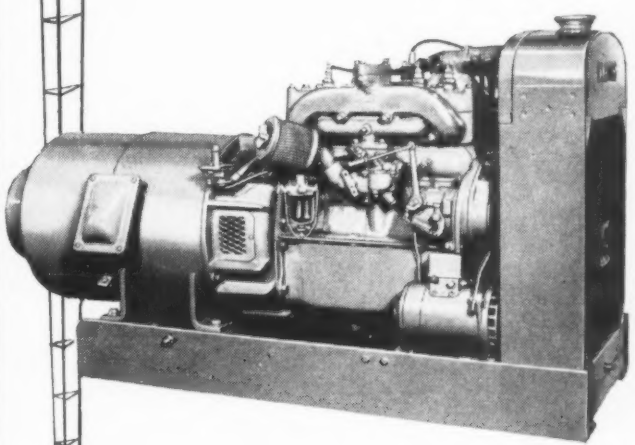

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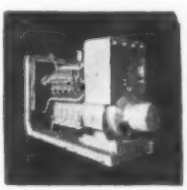

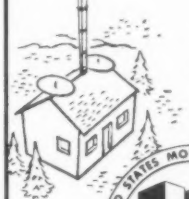

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can be covered with wire mesh, soldered in place.

Doors on metal cabinets housing radio equipment should have copper jumpers soldered across the hinges, and spring brass fingers which will bridge the joint across from the door to the jamb when the door is closed.

All of the methods described in this article have been developed by experiment, and each has worked and served its purpose in some location. However, it is recognized that all cases of interference may not respond to these measures, and extensive plant rearrangements may be necessary in some instances.

Gallup Retires After Long Service to Industry

Some 250 friends and associates gathered recently in Whittier, Calif., to honor Orrin Gallup, central district manager of General Telephone Co. of California, who retired Mar. 31 after nearly a half century of telephone service.

Louis D. Yard, who replaces Mr. Gallup as central district manager, was introduced at the meeting.

Mr. Gallup's service to the telephone industry has spanned nearly every phase of its development. At the age of 15, in 1903, while still attending

ORRIN GALLUP

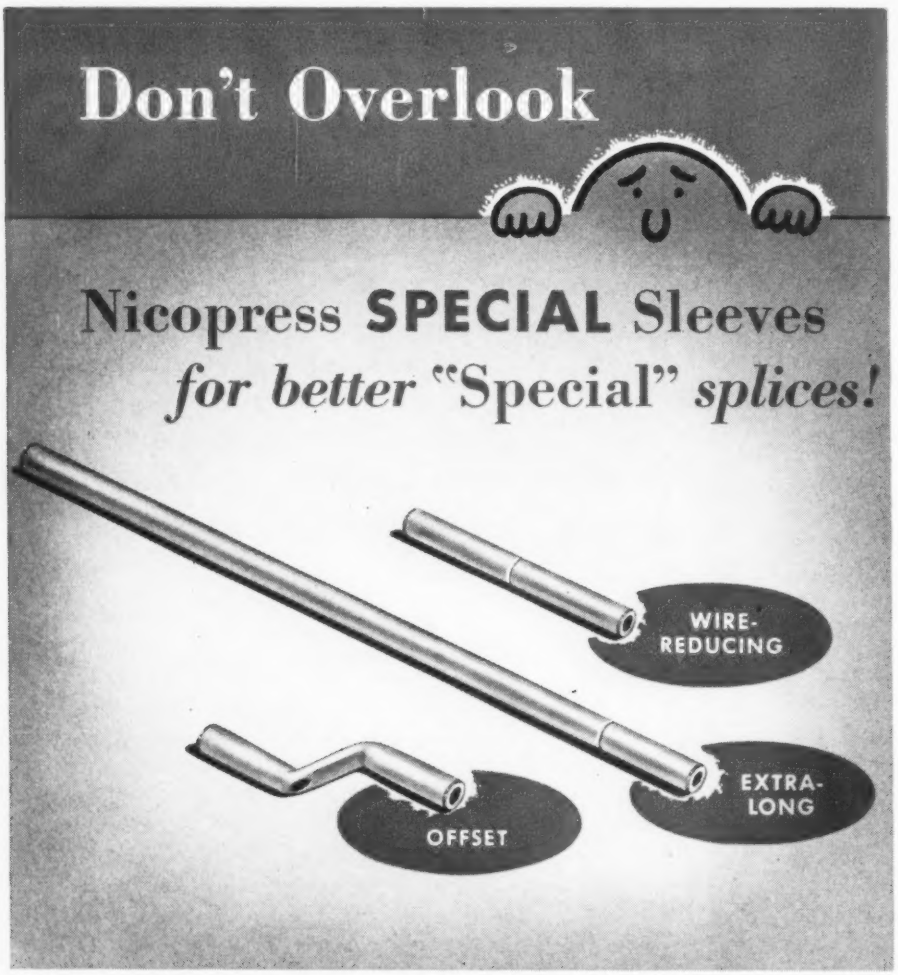
school, he became a night operator for the old Sunset Telephone Co. in Pomona, Calif. From 1904 to 1907 he worked as a lineman and trouble shooter for the Pomona Valley Telephone & Telegraph Union.

On June 19, 1907, he became wire chief for the Whittier Home Telephone & Telegraph Co. He also had charge of wire operations for the Downey Home Telephone & Telegraph Co. In 1912 he became plant superintendent, and in 1922 he became vice president and general manager of the two companies, continuing in this position when they merged to become the Consolidated Telephone Co. He retained this

L. D. YARD

position until the Whittier exchange became a part of Associated Telephone Company in 1948, when he was made central district manager of the area including the Covina, Downey and Whittier exchanges.

At the retirement dinner Mr. Gallup was presented with a handsome calendar watch by master of ceremonies



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Alton Brundige, Whittier manager for the General company.

Mr. Yard, replacing Mr. Gallup as central district manager, started his telephone career in March, 1936, when he went with Associated Telephone Co., Ltd., now General Telephone Co. of California, to assist in converting the company's Ontario office from manual to dial operation, and at the conclusion of that assignment became district plant clerk at Pomona. He transferred to Long Beach in an engineering capacity in 1939, remaining in that position until he was called to active service with the Army Signal Corps as a first lieutenant on June 30, 1941. He was stationed at Las Vegas, Nev., as Base signal officer for the gunnery school which was under construction at that time. During his tour of duty there he was promoted to the rank of captain. He was sent for an advanced air communications course at Fort Monmouth, N. J., in February, 1943, and to the Navy amphibious communications school in Norfolk, Va. in October, 1943.

In January 1944, Mr. Yard was assigned as wing signal officer for a heavy bombardment wing headquarters in North Africa, and in the same capacity went to Foggia, Italy two months later. He became a major in October, 1944. He returned to the United States a year later to spend several months in a hospital in North Carolina before his separation from the service in April, 1946, with the rank of lieutenant colonel. He has maintained his reserve status and presently is assigned to an A.A.C.S. squadron at March Field Air Base.

Upon returning to the company he became an outside plant engineer assigned to the company's headquarters in Santa Monica.

V V

Two Michigan Exchanges Receive Extended Area Service

Union Telephone Co., Owosso, Mich., recently placed in effect extended area service for its customers at Fenwick and Sheridan. Facilities were provided by the company which permit Fenwick and Sheridan customers to call each other without application of a toll charge for each individual message, or handling of such calls as long distance messages.

A new schedule of rates for this service was authorized by the Michigan Public Service Commission and placed in effect by the company.

V V

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ABC of the Telephone

(Continued from page 28)

tomer reports are closed as "Test O.K." or "Found O.K." With this thought in mind the repairman's responsibilities are essentially as follows:

(1) If possible, discuss the case with the person who experienced the trouble and initiated the report.
(2) Check and test the circuit reported in trouble.
(3) Correct any condition found to be the cause of the trouble.
(4) Report any changes made because parts or connections were suspected of causing the trouble.
(5) Where cause of trouble is not found, question the customer to learn facts which might help locate trouble in other circuits or central office equipment.

Fault locating procedures were discussed in PARTS 31, 32 and 33 (TELEPHONY, Jan. 17, 1948; Feb. 21, 1948; Apr. 24, 1948) of this series. For this reason, this article is concerned with fault locating tests and techniques only to the extent that they may apply to gathering information concerning the cause of reports closed as "Test O.K." or "Found O.K." From this viewpoint, the only difference between a "Test

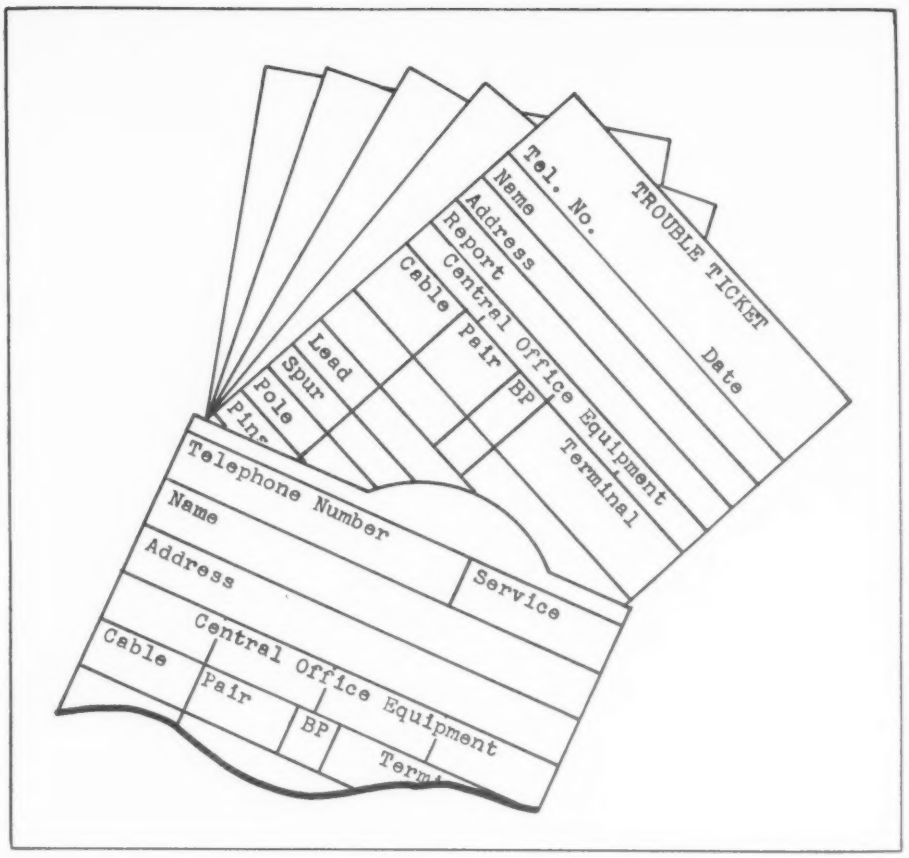

Fig. 4

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DEVELOP INFORMATION ON TROUBLE BY ASKING QUESTIONS

ORIGINATING

- Did you hear dial tone?
- How long did you wait on line?
- Did you receive dial tone later? When?
- What did you hear on the line?
- How often did trouble occur?
- What time of day did you have trouble?
- Did you make or receive a call before trouble occurred? If so, where was the call to or from?
- Do you have an extension telephone?

TERMINATING

- Did someone try to call you? If so, from what telephone?
- How often did trouble occur?
- What time of day?
- What did you hear when you answered?
- At time of trouble, how did the bell ring?
- Did you hear any scratching noises on your line?
- Was your line busy?

TABLE I

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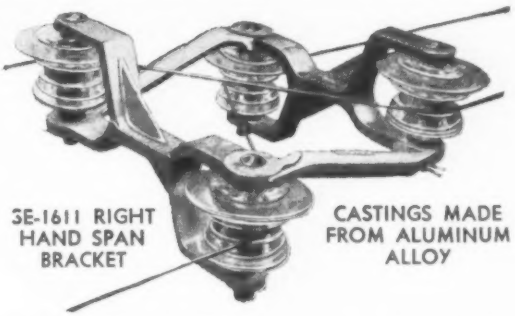

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O.K." closure and a "Found O.K." closure is the physical inspection of the plant and the visit to the subscriber's premises. With this thought in mind, an experienced trouble testman can develop sufficient information to warrant closing many reports without making a field visit.

As mentioned previously, most reports are related to originating or terminating trouble. After a few appropriate introductory comments and questions the repairman may decide to discuss the report with the subscriber along the lines set forth in *Table I.* (NOTE: These questions were developed for dial lines. Similar questions can be developed for manual common battery or magneto lines.)

It should be kept in mind that the questions in *Table I* are merely a guide. Any single question may require additional exploration or follow-up. Also, the testman can ask the customer to make normal use of the telephone while it is connected to the test cord, such as:

(1) Dial zero (operator) to check for dial pulses.

(2) Operate the switchhook to observe proper opening and closing of the circuit.

(3) Move the cords near the handset to check for noise or cut-out.

(4) Make transmission and ringing tests.

(5) Discuss general condition of the telephone.

If, after these tests and questioning of the customer has been completed, the testman is still in doubt, or if he believes the customer's complaints are chronic and can only be satisfied by the visit of a repairman, a repairman should be dispatched to the case. However, if this is an "O.K. case," the repairman should discuss the difficulty with the customer along the same lines as presented in *Table I.*

Finally, an "O.K. case" should be closed as such, and detailed information should be entered on the trouble ticket. Typical entries of pertinent information are as follows:

F.O.K.—Hears clicking noise for several seconds before dial tone is received.

T.O.K.—Could not originate call after receiving call from 1520.

T.O.K.—Subscriber complains of dial tone delay around 4 p.m. each day.

As an extra precaution, retests can be arranged with the subscriber. Retests are particularly valuable when the customer is unable to provide information which may be needed to determine the cause of the trouble. Another advantage of making a retest is the favorable customer reaction because the telephone company is domon-

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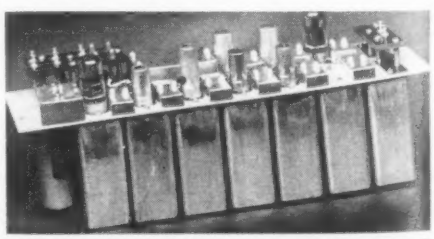


McELROY Manufacturing Co.

LITTLETON, MASSACHUSETTS, U.S.A.

strating an interest in the customer's problem.

How can "Test O.K." and "Found O.K." information be used in central office maintenance?

A large portion of this article has been devoted to the activity of the testman and repairman in developing information which may prove valuable to the central office maintenance man. This approach was used in order that the central office maintenance men will have the proper confidence and the respect for the information developed by others for his use.

Occasionally, an individual report closed as O.K. in the outside plant will be developed to a point where the central office switchman will be justified in making additional equipment tests and inspections. An example is a report from a dial line where it is developed that the line goes dead after dialing.

Other O.K. reports may be like links in a chain. One report alone may be meaningless. However, a number of similar reports may be clues to common trouble. If these clues are observed and heeded, central office equipment trouble usually can be located and cleared before it develops into a major service failure.

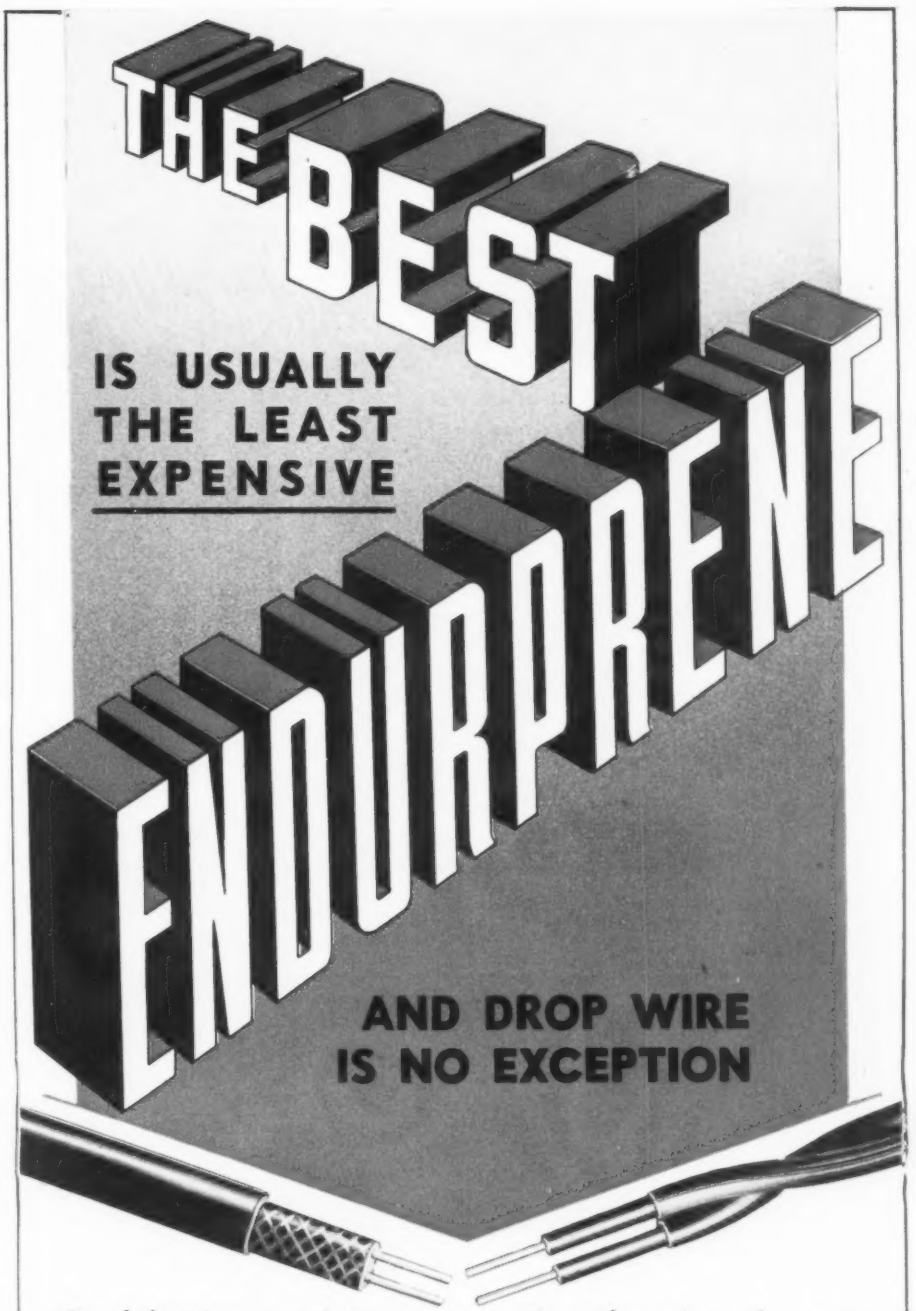
How can the central office maintenance man keep informed about O.K. subscriber reports?

The answer to this question lies in selecting an analysis routine which is most suitable to the central office. Larger central offices have found advantages in entering all O.K. reports daily on a classified stroke sheet record. This record is broken down by office units and general type of report such as originating, terminating, miscellaneous, etc. As in the general log summaries previously discussed, a pattern of O.K. cases soon is established. After this, significant changes in daily totals, or of the combined total of a few days, serve as a guide to determine when detailed analysis of the general log is required.

In smaller exchanges the maintenance of the "O.K. report" study on a daily basis may not be warranted. Under these circumstances the central office maintenance man can develop good leads to equipment trouble by reviewing all "O.K. reports" on a daily or weekly basis. Here again, the general log may be used to check similar reports that may have occurred during the past week or earlier.

Among the many advantages to be gained by comparing current results with the record of past performances is:

To indicate the need for specific preventive maintenance routines. As an



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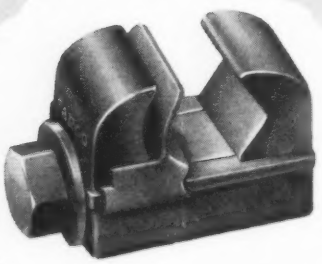
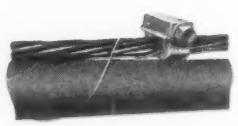
FARGO LASHING WIRE CLAMP B-3

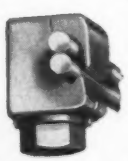
The B-3 clamp is hot dipped galvanized malleable iron with an electro-zinc plated bolt. Fargo's "vise-type", one-piece" design is used. A "V" groove centers messenger strands in the clamp. A shoulder on the stainless steel pressure bar controls the position of the lashing wire.

Fargo's B-3 takes any size lashing wire and any size messenger up to 16M stranding (½"). The "one-piece" construction makes it easy to install. The "vise-type" feature makes the clamp vibration proof while holding the lashing wire to its full breaking strength. The B-3 is readily salvageable.



FARGO "5000" CONNECTORS





Fargo "vise-type", "one-piece" connectors are an ideal, easy to use unit for bridging connections. Available in sizes from No. 8 to 1,000 MCM.

FARGO

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example, assume there is an increase in the number of trouble reports closed to open wire, Code 22. An increase of a few cases in any one month would not be alarming. However, if the current results over a period of several months reflect a significant increase in open wire troubles, a trend or pattern may be established.

The next step is to break down or study the open wire troubles. The general log simplifies this procedure. Each general log sheet for the period selected for the study is reviewed. A list of all trouble reports charged to open wire, Code 22, is prepared. The code summary column will show how many open wire cases are on each log sheet. Thus, it is possible to by-pass those sheets on which Code 22 does not appear.

When the study list is completed, each individual case should be analyzed and recorded on a tally sheet. If the details of trouble reports are entered on subscriber line cards, the line cards should be pulled and the specific cases reviewed. When the pouch type line card is used, the trouble ticket involved is all that need be removed from each subscriber line pouch.

The results developed on the tally sheet will classify the trouble reports according to the various categories of open wire trouble. Typical categories may be:

Broken guy wire.
Pole down.
Broken cross-arm.
Insulator broken or missing.
Branches on wires.
Wires down.
High resistance splices, etc.

After the reports are classified, it may be possible to determine whether or not some kind of preventive maintenance work is warranted. If reports closed to branches on wire or wires down are high, a program of tree trimming may be advisable along specific rights-of-way. In a similar manner, the study results may show that cross-arm and insulator breakage is high. In this case a program of inspection and replacement of cross-arms and missing insulators may be warranted.

The important point is that preventive maintenance based on careful trouble analysis usually results in the most profitable return for the money invested. Again this emphasizes the value of a complete general log.

Subscriber Line Card

The general log provides a means of recording and summarizing trouble reports for a central office area. In a more or less similar manner, a subscriber line card is used to record station data and trouble reports received from individual subscribers. Usually a record of all major items of equipment

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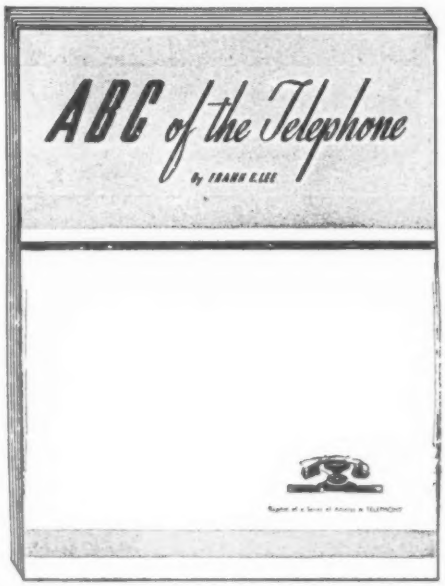

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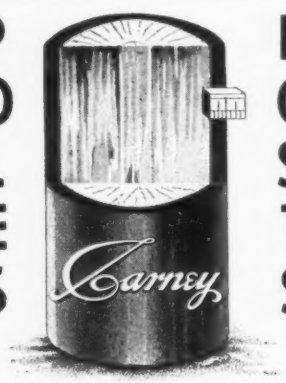

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assigned to a subscriber line is entered on the line card. This may include all or part of the following data:

Telephone number.
Class of service.
Central office equipment assignment.
Message register.
Type of station apparatus.
Special equipment.
Cable conductors.

Sufficient space for this information can be provided in approximately the upper one-third of a 3½ inches by 8 inches line card. The balance of the front and the reverse side of the card can be ruled off to provide spaces for the recording of trouble reports. An example of how the trouble report spaces can be arranged on the line card is shown in *Fig. 3*.

This line card illustrates the commonly accepted method of using a master heading to designate the use of the various spaces provided for each trouble report. The simple design of the report spaces on this card makes it easy to use. Also, spaces for recording pertinent time data of each report are grouped on the left hand margin. This arrangement facilitates making time to clear analysis of individual subscriber reports. The trouble code space stands out clearly on the right margin of the card.

When the line card system of recording trouble reports on subscriber lines is used, someone must be responsible for maintaining the file. The amount of work required for this purpose may range from part time study for one clerk in a small office to full-time work for three or four clerks in a large office. Essentially, the line card provides an individual trouble log for each subscriber line. Also, the line card is used as a record of plant facilities assigned to the line. However, it does not provide an integrated system of associating the repairman's trouble ticket with the line card.

If this feature is considered desirable, a pouch type line card, shown in *Fig. 4*, can be used. Spaces are provided on the front of the pouch for recording the plant facilities assigned to the line. Also, spaces are provided on the front and back of the pouch for recording service order activity. Thus, it is likely a pouch may serve a number of lines during the course of its useful life.

Trouble tickets can be placed in the pouches where the complete history of each trouble report will be available for ready reference. Thus, the pouch card eliminates the need of transcribing the details of each case of trouble from the trouble ticket to the line card.

Summary

Central office maintenance is geared to the outside plant and to the customer reports received at the repair center. The best results can be achieved by thorough investigation and development of all trouble reports. Careful investigation and follow-up of "O.K. reports" should be made on the belief there must have been a reason for the customer's report. In this way the telephone company is fulfilling Point 4—Service failures should be held to a minimum—of the standards of service as set forth in PART 61 of this series.

(To Be Continued)

TOWARD PEACE

The more quietly and peaceably we all get on, the better—the better for ourselves and the better for our neighbors. In nine cases out of ten the wisest policy is, if a man cheats you, quit dealing with him; if he is abusive, quit his company; if he slanders you, take care to live so that nobody will believe him. No matter who he is, or how he misuses you, the wisest way is to let him alone; for there is nothing better than this cool, calm, quiet way of dealing with the wrongs we meet with.—BISHOP SIMON PATRICK.

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Kellogg Announces New Branch at Mansfield, O.

F. M. Parsons, vice president and sales manager, Kellogg Switchboard & Supply Co., Chicago, Ill., announces a new branch warehouse to be opened in the near future at Mansfield, O.

Ground already has been broken for the construction of this modern, one-story building to be equipped with a complete line of Kellogg apparatus and line supplies. The new building will be located directly on route U.S. 30-N., one mile west of the Mansfield city limits. The address will be 1555 W. 4th St., Mansfield, O.

This is in line with Kellogg's policy to supply customers with warehouse facilities from coast to coast, according to Mr. Parsons.

V V

Bell Adds Holyoke, Mass., To Television Network

Station WHYN-TV, Holyoke, Mass., has been connected to the Bell Telephone System's nationwide television network facilities, according to an announcement by the Long Lines Department of the American Telephone & Telegraph Co. The station began commercial broadcasts on Apr. 14.

Network programs are made available to Holyoke over a newly constructed microwave link, which is connected to the New York-Boston radio-relay system, Long Lines said.

With the addition of Holyoke's new station, network programs are now available to 128 television stations in 83 cities in the United States.

V V

Vienna Adds Still Another Telephone Service

Several times on our *Flashes and Plugs* page, we've told you about Austria's communications developments; how telephone subscribers in Vienna, by dialing various numbers, can obtain the time and weather as well as fairy tales for children, recipes for housewives, information on snow conditions for skiers, and a host of other services.

Now the versatile Vienna telephone system has introduced another new automatic service—dictation for student stenographers.

By dialing A17-5-70, shorthand students who want practice, can get six minutes of dictation. The lesson changes every other day. The dictation speed, the Vienna postoffice said, will climb from 100 to 160 syllables a minute.

It also announced that it is planning to offer ideas for hiking excursions, and a daily theater and movie house program listing.

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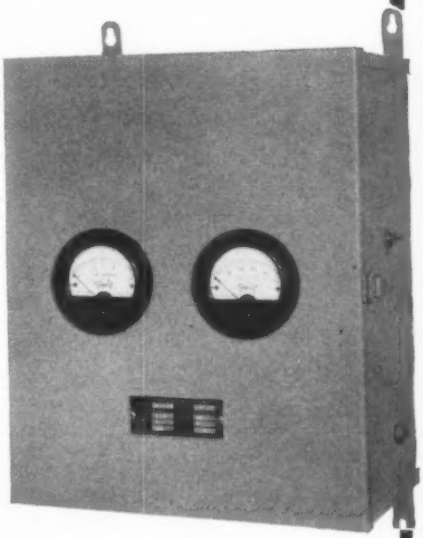

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Fire Vehicles' Two-Way Radio Contributes to Safety

Many New York City motorists have expressed bewilderment in the last few months upon seeing mobile fire apparatus, obviously rolling through the streets on duty, decorously come to a stop, like most other vehicles, on approaching a red light.

The city's fire department recently disclosed that, since February, when the department completed the installation of two-way radio equipment in its cars and trucks, drivers have been under strict orders to halt at red lights when returning from calls.

A department spokesman explained that, before that time, those cars and trucks without radio facilities had to speed back to quarters from fire-calls, to be ready as soon as possible for further emergencies.

Now, with two-way radios in all mobile equipment, there is no special rush for the fire vehicle to get home. The car or truck can be signaled en route and sent immediately wherever needed.

V V

>> Did you know that of all the hard working parts in the telephone system, relays are perhaps the most indefatigable? Many of them are required to operate hundreds of millions of times and some especially industrious ones are called on to open and close circuits over a *billion times* without attention. As many as 50,000 to 100,000 relays may be installed in a single large, modern dial office.—Chesapeake & Potomac *Call*.

V V

"Every time there has been a reduction in federal tax rates, the following year saw an increase in the amount of over-all revenue collected by the government," says the Chamber of Commerce of the United States.

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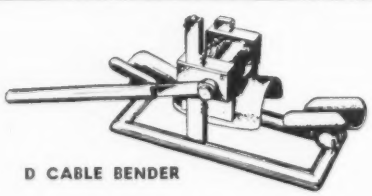
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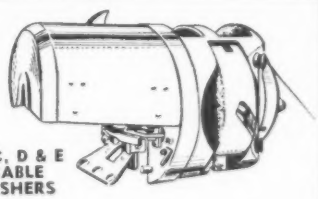
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